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CONTENTS

PEOPLE'S REPUBLIC OF CHINA

NATIONAL POLICY AND ISSUES

Initial Reform in China's Economic Structure
(SOCIAL SCIENCES IN CHINA, Sep 80) 1

ECONOMIC PLANNING

Guangdong's Problems in Light Industrial Development Aired
(Wang Anmin, et al.; XUESHU YANJIU, No 6, 1980) 24

ENERGY

New Power Station Marks Beginning of Geothermal Development
(Wu Chuanlin; XIN NENG YUAN, 5 Oct 80) 34

CAS Devoting Efforts to Energy Resource Research, Development
(Zhou Wenbin, Ren Xinfa; GUANGMING RIBAO, 1 Oct 80) 40

New Techniques Necessary for Large Scale Conservation
(Lin Hua; GUANGMING RIBAO, 22 Aug 80) 42

Marsh Gas Called Revolutionary Rural Energy Source
(Qu Geping; HUANJING, 30 Dec 80) 46

Oil-Water Emulsification Applied to Steelmaking
(GUANGMING RIBAO, 19 Nov 80) 50

INDUSTRY

Active But Cautious Readjustment of Industry Urged
(Editorial; DAZHONG RIBAO, 10 Feb 81) 52

1980 Industrial Production in Hubei, Fujian Reported
(HUBEI RIBAO, 14 Jan 81; FUJIAN RIBAO, 11 Jan 81) 57

Output Increase in Hubei
Fujian Surpasses Plan

CONSTRUCTION

Necessity of Reduced Capital Construction Stressed
(Zhao Wensheng, et al.; SHANXI RIBAO, 9 Feb 81) 61

FOREIGN TRADE

Beijing Foreign Trade Up 40 Percent in 1980
(Bei Qiang, Jing Shan; BEIJING RIBAO, 12 Jan 81) 66

Special Policies, Flexible Procedures Boost Guangdong's Foreign Trade
(Deng Xuzhen; NANFANG RIBAO, 26 Dec 80) 68

Shanxi Purchases, Exports Hit Record High
(Xu Jing; SHANXI RIBAO, 18 Jan 81) 70

TRANSPORTATION

New Xinjiang Rail Route Described
(Chen Yuanmou; TIEDAO ZHISHI, Jan 81) 72

NATIONAL POLICY AND ISSUES

INITIAL REFORM IN CHINA'S ECONOMIC STRUCTURE

Beijing SOCIAL SCIENCES IN CHINA in English Vol 1, No 3, Sep 80 pp 172-194

[Text]

The economic reform in China has begun with a number of successful experiments — an indication that, given a proper economic framework, her socialist modernization will forge ahead with fresh impetus.

The decision to reform China's economic management was made at the Third Plenary Session of the Eleventh Central Committee of the Chinese Communist Party in December 1978. Since then, economic theorists have explored ways to reform the economy, advancing all kinds of views and deepening them in the course of discussion. Meanwhile, men of action determined to carry out the reform have begun the process, giving enterprises more autonomy on an experimental basis in many provinces and municipalities.

I was on a team which visited Sichuan, Anhui and Zhejiang provinces from October to December in 1979 and made a preliminary study of developments in the enterprises under experiment.

The investigations gave me the deep impression that the Party's policy to carry out economic reforms had won popular support and was being translated into action. The experiments were not extensive, nor were they a radical departure from the old economic structure, but the achievements were obvious. Total earnings realized by enterprises under experiment in Sichuan Province in 1979 increased substantially over 1978, and the earnings of these enterprises invariably exceeded those of the rest. No one could deny the fact that greater autonomy enabled these enterprises to accumulate more funds for the state and create more wealth for society.

But the significance of the experiments goes far beyond this. They are a breach in the old economic structure which has constrained the growth of productive forces for years. The acquisition of an internal driving force has breathed new life into the once listless economy. There is much food for thought in these experiments, which will help us emancipate our minds, ease our doubts, enhance our confidence and strengthen our resolve to carry through the reform. On the other hand, the problems and contradictions that have appeared in the experiments will inspire us to think anew and improve the theory of the reform.

In particular, it should be noted that the experiments are entirely different from all previous attempts to change the economic structure, which alternated between the centralization and decentralization of power within the setup for economic administration. The present experiments are focussed on the material interests of the enterprise as a community of immediate producers. Thus they take on an entirely new nature, that of changing socio-economic relations. The widening of the experiments will enable people to see their far-reaching significance as the beginning of a great socio-economic change.

I. The New Economic Relations Created by the Experiments

Experiments in giving more autonomy to enterprises began in Sichuan Province in October 1978. Following the Third Plenary Session of the Party's Central Committee in December, the number of enterprises under experiment increased from 6 to 100 during 1979, and rose to 300 in 1980. Experiments began in 80 enterprises in Anhui and in 74 enterprises in Zhejiang in the last quarter of 1979.

There have been reports and articles on the measures that have been tried out in the three provinces, particularly in Sichuan, and their effectiveness in boosting production and increasing accumulation. To avoid repetition, I shall not discuss these measures in great detail but concentrate on the changes in socio-economic relations and their significance.

The Production Process

Formerly enterprises had no say on the items to be produced, their quantities and the ways to produce them, all of which were provided for in state plans. Now the enterprises under experiment may produce goods in addition to those specified in state plans. When they had to confine themselves to state plans, their surplus productive capacity remained idle. Sometimes they had to produce planned goods which, as they knew, could find no customers and promised no realization of their value. This is being changed by the experiments. Examples are the Sichuan Dujiang Woodworking Machinery Plant and the No. 1 Cotton Textile Mill.

The Dujiang plant turns out a wide range of power saws, planers and milling machines which are of good quality and well appreciated at home and abroad. Last year, the state drastically reduced the output targets for the plant. By the old way of doing things, the plant would have had to stay within the limits set by state plans and idle much of its productive capacity. But since it was an enterprise under experiment and had been granted power to do things on its own, it tried a number of ways to expand production. It printed an attractive catalogue of its line of goods, mailed it to all parts of the country, and dispatched four teams to canvass customer opinions in various provinces and municipalities. Customers came knocking at its door, and orders piled up. A big proportion of its 1979 output was taken up by goods it produced by its own decision through a full utilization of its capacity.

The Sichuan No. 1 Cotton Textile Mill used to do everything according to state plans. Some of its products were overstocked because of poor demand, while others were underproduced and sold out. After the mill began its experiment, it continued to produce according to state targets, but tried out new products on the basis of market surveys. By the conventional practice it should first design a product, then produce it and finally set the price. But this time it reversed the procedure. After comparing the sales of polyester twill fabrics of different prices and quality, it discovered that those priced under 1.50 yuan per foot was the most popular. So it decided to manufacture a twill that would sell at 1.49 yuan, which sold exceedingly well because it was within the purchasing power of most customers and the price appealed to customer mentality. So the experiment has resulted in a significant change in the production process. Previously it was the state which actually handled the labor force and the material means of production. Now it is still up to the state to decide what is to be produced, how much and how, but the enterprises have been granted a say over such matters and are beginning to play a decisive role in the production process.

The Circulation Process

Formerly the equipment, raw and processed materials, and energy resources needed by an enterprise were all supplied by the state, which also bought and sold all its products. It had to accept everything provided by the state in the allocated amount and at the official price. This compulsory and inflexible approach applied likewise to the marketing of its products. In an enterprise under experiment, some flexibility has been introduced with regard to procurement and sales. The Zhongnan Rubber Plant in Chongqing got an inadequate state supply of raw rubber in 1979 because of a cut in imported rubber. If the plant were to depend solely on state supplies, it would have been compelled to slash production. But the reform permitted it to send purchasing agents to Yunnan, Guangxi and other regions, where they signed contracts for the supply of some 30 per cent of the raw material needed for the year. The result was a doubling of its 1979 profits.

For years rolled steel had been an item subject to state purchase and allocation on a monopoly basis. The rigid control was broken down by the Chongqing Iron and Steel Plant when it began to reform its business operations. The plant was allowed to sell on its own one-fifth of its output of 500,000 tons of rolled steel produced in 1979. The prices for rolled steel products sold by the plant floated with market demand, but they were generally lower than state prices because of exemption from intermediary handling fees charged by supply agencies. The majority of enterprises under experiment have acted more or less independently in the marketing of their products. Of course, they are still far from getting all their raw and processed materials and their fuels and marketing all their goods through business contracts. But they are moving in that direction.

Distribution

By the old practice, the enterprises turned over all their earnings to the state and received allocations for all their expenditures out of the state budget, including the outlays for reproduction and for wages and bonuses. In an enterprise under experiment, apart from the fund earmarked for the personal consumption of the workers, the net income is divided between the state and the enterprise by a certain ratio or what is called a "profit retention system." Profit is the mirror of economic performance. The volume of output, the quality of goods, the amount of input and the circulation of working capital — these are all reflected in the rate of profit. To retain more of its profit, an enterprise is bound to boost its output, improve quality, cut down costs and speed up the circulation of funds. An enterprise pursuing its own financial interest acquires a built-in motor for managerial improvement. The enterprises now under experiment are retaining a small percentage of their profit. Nevertheless, they have at last acquired some funds for use at their own discretion, and may reinvest them in production, spend them on collective welfare or distribute them as bonuses. The No. 2 Knitwear Factory in Chongqing used 60,000 yuan (40,000 U.S. dollars) of its retained profit to buy twenty sock-knitting machines in February 1979. Six months after the machines went into operation, it earned 138,000 more yuan in profit. Then it bought another sixty sock-knitting machines, by which it earned 630,000 more yuan by the end of the year. The projected total profit for 1980 is around 1.8 million yuan. Meanwhile, the factory spent another 150,000 yuan on a housing project with a total floor space of 1,500 square meters, something the workers had looked forward to for a decade. It had been requesting authorization for an expansion of its equipment for five years, but to no avail. Now it took only one year to fulfil the purpose by its own resources.

Competition

When enterprises begin to enjoy their financial interests, their economic behavior changes. To enhance such interests, they endeavor to expend less labor on their products than the general average. When all enterprises try to do this, what you get is competition. The initial economic reform has indeed ushered in an initial measure of competition. The Ningjiang Machine Tool Plant in Sichuan Province produced good and relatively cheap lathes. In 1979, however, it didn't have much work to do because the state had reduced its output targets. The management realized that while there had been a glut of machine tools in recent years, the small and medium-sized precision lathes produced by the plant were still in great demand, especially because of their quality and reasonable prices. The sluggish sales were due to the inefficient distribution of machine tools, not to the products themselves. To operate its equipment at full capacity and increase earnings, the plant published an advertisement in the June 25th edition of the *People's Daily*, announcing that "direct orders from home and abroad will be accepted." This brought in a flood of orders, resulting in contracts for more than 1,000 lathes with domestic and foreign customers. The success exerted pressure on four other enterprises producing similar types of lathes. With an ex-factory price of 9,500 yuan, the 7 mm high-precision automatic lathe from the Ningjiang plant was highly efficient and easy to operate. Similar manufacturers in Shanghai, Liaoning, Hangzhou and Xi'an had to mark down the prices of their goods to stay in the market. The Xi'an plant in Shaanxi reduced the price of its lathes from 20,000 to 15,000 yuan each, but still found no customers. And when it further cut the price to 10,000 yuan, it had to discontinue production because of the big loss. The Hangzhou Instruments Equipment Plant in Zhejiang turned out only thirty similar lathes in 1979. When the advertisement of the Ningjiang plant appeared in the *People's Daily*, customers rushed to cancel the orders they had placed with the Hangzhou plant, which had to send out people to sell its lathes at a commission of 30 yuan apiece. When these were all sold, it decided to produce no more. The No. 11 Machine Tool Plant in Shanghai also admitted that it was no match for the Ningjiang plant and got ready to change its line of products.

As a new feature of our socialist economic life, competition could also be discerned at a conference for the allocation of machinery and electrical appliances held in Wenjiang Prefecture, Sichuan Province, in October 1979. People referred to the occasion as a "miniature Guangzhou Fair" — one similar to the international trade fair held in Guangzhou (Canton) every spring and autumn. On this market dealing in capital goods, products from different factories were put on display for free purchase without any extra-economic compulsion. Prices had to be lowered on goods of poorer quality, which naturally meant a floating of prices which no one could obstruct. For instance, glass fibers made in Luzhou and Zigong were priced at 5,800 yuan per ton, whereas those from Chongqing was sold at 3,800 yuan. The rush to buy the latter forced down the price of the former to 3,800 yuan. But the salesmen from Luzhou and Zigong did not get a single contract because of the poorer quality of their goods. People from some factories withdrew their exhibits on account of their lack of competitiveness, and went home to study ways to improve quality and lower the costs.

Joint Investment

In the experiments in Sichuan Province, enterprises may use their earnings to expand production or invest them in other enterprises for joint ventures. In December 1979, the Luzhou Natural Gas Chemical Works invested a profit of five million yuan in the Luzhou Paper Mill for the construction of a new workshop. Scheduled to be commissioned by January 1, 1982, the workshop will be run by the Luzhou Paper Mill to produce one kind of paper for export and another for domestic use. The two parties will share the profit by an agreed percentage, with most of the foreign exchange earnings going to the Luzhou Natural Gas Chemical Works. The Luzhou Paper Mill will pay back the capital investment from the chemical works in ten annual installments. This bold scheme is seen as an innovation in the use of industrial funds which may bring changes in the country's socio-economic relations.

A New Type of Commodity Economy

As stated in the previous passages, the experiments in giving the enterprises more autonomy have enabled them to decide on the production of some of their goods, enter into contracts for the procurement of some means of production, market some of their products, retain part of their profit and use it as they see fit. Their financial interest prompts them to engage in competition and gives them a sense of urgency and a spirit of thrift and diligence. These are heartening developments marking the emergence of a new type of economy — a commodity economy that is neither capitalist nor based on individual small-scale production. As distinguished from the self-sufficiency, relations of dependence and extra-economic compulsion typical of all natural economies, a commodity economy is characterized by social production, contractual relations and economic leverages. The new changes resulting from the experiments have now introduced these features into the economic relations in China. Enterprises have signed contracts on procurement, production and sales, expanding the horizontal ties between them. Their economic decisions are based on economic considerations and are free from interference from non-economic influences. However, such a new commodity economy in a socialist country is a developed commodity economy that excludes labor power from the realm of commodities. It is not a commodity economy in a complete or pure sense, and the competition it entails is different from that under capitalism in two respects:

(1) Competition takes place not between private capitals but between enterprises that are associations of laborers. It promotes the collective welfare of the laborers and allows no private capital to extract a maximum surplus value from laborers.

(2) Since the economy is regulated by an initial and rudimentary form of planning, competition is weakened in both extent and magnitude.

Owing to these two characteristics, the competition in the new commodity economy is a limited one which serves as an effective remedy for the equalitarian treatment of enterprises and individuals regardless of their performances. It invigorates the nation and creates a general atmosphere of tension and hard work indispensable to the building of socialism.

A developed commodity economy is a stage that cannot be skipped over in socio-economic history. The productive forces in old China were quite backward. Due to historical circumstances, however, a proletarian revolution had to be carried out and triumphed in the end. The commodity economy in the country, which remains underdeveloped, has to be built up, but via a new road. A new type of commodity economy suited to modernization answers the demand of the times. The nation is finally building such an economy now that she has embarked on the course of modernization after experiencing the twists and turns in socialist construction in the past three decades.

How People Look at the Reforms

Do people support a new commodity economy?

During our tour, we found a surprisingly great number of activists who were committed to the economic reforms and working hard to make the experiments a success. They included factory managers and Party secretaries and leaders of provinces, municipalities and various economic departments. In particular, many cadres in grassroots units were full of ambition and energy.

Chen Weiyi, manager of Chengdu's Measuring and Cutting Tools Factory, likened an enterprise granted the rights of autonomy to a seed. He said that a stone buried underground would never come to the surface by itself, but a seed would. "We want to be a seed," he declared.

Zhou Guangbin, Party Secretary of Hefei's No. 1 Radio Factory in Anhui Province, seemed a capable man in the prime of his life. He expressed the hope that his factory would be authorized as an enterprise responsible for its own profits and losses operating under a manager elected at a workers' congress. He said that if he were elected, he would "form his own cabinet," that is, select an efficient group of people to direct production. He was sure of making the factory prosperous. In case his experiment failed, he said, he would be willing to accept all economic and legal consequences, including going to jail.

Besides business executives committed to the experiments, there are quite a number of reformers among cadres who have worked in financial and economic departments for years. Ni Zegeng, Vice-Director of the Economic Commission of Anhui Province, is in his late sixties. He said he had been working in the field of industry and transport ever since the founding of the People's Republic and knew the whole story about the past thirty years. The crux of the problem, he said, has now been revealed more clearly than ever: the country would get nowhere by sticking to the hidebound ways of a natural economy. When asked what would happen if Anhui's radios and other products proved to be no match for those from Shanghai, he said: That's no problem. Shanghai's high-quality transistor radios might get the upper hand on the urban market, but those from Anhui, though not as good, would be much cheaper and might dominate the rural market. Even if our products couldn't compete with similar ones, he said, that wouldn't be a bad thing because this kind of pressure would become an impetus to progress. That's why a commodity economy spurs production. There is no need to be apprehensive of competition. It will bring us prosperity.

What was the attitude of leading cadres towards the experiments? A leading comrade on the Sichuan Provincial Party Committee had been inspecting the enterprises under experiment one by one since he took office. In an exchange of views with our team, he pointed out that China's present economic structure had revealed a number of drawbacks which had to be eliminated, and his province was trying to find a solution through the experiments. A leading comrade in Anhui Province showed keen interest in the reforms and when we told him that Zhou Guangbin, Party Secretary of Hefei's No. 1 Radio Factory, wished to put his factory under experiment, he immediately secured official approval for him to go ahead with the reforms.

Clearly, the experiments are freeing people from inhibitions that had lasted for years, enabling them to make bold plans and give wide scope to their talents. The new developments also compel some people to re-examine their conventional ideas and practices and catch up with the times.

"People are longing for a change." These were the words of Sun Zhangbin, Party Secretary of the Dujiang Woodworking Machinery Plant in Sichuan. Our fifty-day investigation gave us the same impression. There was a map of the world near the entrance of the Dujiang plant showing the countries where its products had been sold. It indicated that people there were interested in making a name for their goods on the international market. As China's socialist modernization makes headway, her products will become ever better known abroad. But of greater interest to the world is perhaps the fact that the social forces committed to economic reforms in China are gathering strength under the leadership of the Communist Party, and their advance seems irresistible.

II. Contradictions Between the New Economic Relations and the Old Structure

The new economic relations taking shape in China have begun to show their vigor and vitality because they correspond to the present level of China's productive forces and form an economic structure both necessary for and appropriate to China's modernization. Of course, these relations are coming into being just now and are not yet mature or universal. The old economic structure, a system of centralized management mainly by administrative methods, has revealed many weaknesses, but it did play a positive role when it was first established and has enjoyed undisputed predominance for years. It is the customary way of running things, and some people have a vested interest in its continuation. In the course of their formation and growth, the new economic relations are bound to come into conflict with the old economic structure. In the final analysis, this is but a reflection of the contradiction between the productive forces and the relations of production.

The Division of Profits

The new type of commodity economy that has emerged with the experiments in structural reform operates within the framework of a state economy. The material means of production are made over by the state to the enterprises for their possession and use. Since the enterprises are in possession of the means of production, they become more or less independent economic entities and commodity producers. They must be able to cover their outlays by their earnings. They must be able to carry on not only simple reproduction but also extended reproduction by the use of their own accumulation funds. For this purpose, the enterprises must depend on their own funds and not on state appropriations for investment purposes. The enterprises now under experiment, however, are still unable to do this.

Our initial data show that in 1979, 84 enterprises under experiment in Sichuan Province turned over 92 per cent of their profits to the state and retained only 8 per cent. Of course, the state allocated some funds to these enterprises for reproduction. This meant, in effect, that 80 per cent of the profits went to the state while 20 per cent were kept by the enterprises. But the amount was not enough to ensure the normal growth of the enterprises. The Chengdu Measuring and Cutting Tools Factory was an old enterprise with more than 4,000 workers and staff members. According to its three-year plan, it would need at least three million yuan a year for the renovation of its equipment. But the present experiment only gave it two million yuan a year for technological renovation, which meant a gap of one million yuan. The No. 1 Cotton Textile Mill in Sichuan set aside in 1979 a sum of 2.8 million yuan from its retained profits for renovating its equipment. This represented a 70 per cent increase over 1978 in funds devoted to the same purpose, but it was still some 800,000 yuan short of the required sum of 3.6 million yuan. We asked leaders of enterprises under experiment what percentage of profits they would suggest for retention to ensure the normal growth of these enterprises without reliance on state appropriations. The manager of the rather profitable No. 1 Cotton Textile Mill in Sichuan replied that a 70 to 30 per cent division between the state and his enterprise would be fine. The manager of the Chengdu Measuring and Cutting Tools Factory put the ratio at 60 to 40 per cent in view of this old factory's heavier burden in trying to tap its potentials through technical innovation and transformation. A leader of Chongqing's No. 2 Cotton Textile Mill said that in the next few years, the ratio should be 40 per cent to the state and 60 per cent to the enterprise because in recent years too little had been done to improve workers' welfare and much money would be needed to repay this "debt." These suggested ratios are all much higher than the present ones and are of course based on the premise that the enterprises would become more or less independent producers of commodities. But their relative independence can only be achieved through a thorough-going reform, which cannot be accomplished overnight. State revenue must not be reduced in the meantime. Thus the enterprises under experiment must try to obtain a maximum of results from their limited funds. They should not rely on the state for financial assistance for things they ought to do by themselves. However, the contradiction between them and the state on the question of profit retention will remain in the absence of a thorough-going reform.

The funds made available to the enterprises through the profit retention scheme, though not very large, can nevertheless be used by them in any way they see fit. Generally speaking, the bulk of these funds will be reinvested for the next cycle of production. If we take this fact as our point of departure and trace the motion of this increased investment, we will see how it is hamstrung by the old economic structure at each and every step.

Obstacles to the Reforms

To carry out reproduction, an enterprise must first turn its funds into means of production, including the raw and processed materials, energy resources and various other materials needed to tap its potentials through technical innovation and transformation. In this respect, the enterprises under experiment have far too little authority to act as they see fit, for the supply of the means of production is still controlled largely by the allocation authorities and state commercial agencies. Contracts between enterprises for the procurement of equipment and raw materials only take care of a small proportion of the supplies. There has been no fundamental change in the system whereby enterprises have to accept anything allocated to them in any quantity. This system greatly hampers the process of funds turning into means of production and works against economic efficiency and the interests of the enterprises.

For instance, products made by the Dujiang Woodworking Machinery Plant in Sichuan Province are sold in Southeast Asian countries. But the electric motors powering their machine tools are made in Jingdezhen, Jiangxi Province. Though of poor quality, they cost around 600 yuan each. A similar motor manufactured by the Siemens Company in the Federal Republic of Germany costs only about a hundred yuan, but the factory had to accept the Jingdezhen motors allocated by the authorities. This, of course, affects the competitiveness of its products.

The No. 2 Knitwear Factory in Chongqing was allocated 81 sock-knitting machines by the Ministry of Textile Industry, but it could not buy them for lack of funds. After it came under the profit retention scheme in 1979, it gradually accumulated the funds to buy the equipment. In 1980 it wanted to buy a number of model 507 double-weave sock-knitting machines to replace all its outmoded equipment, but the allocation authorities said it could not get them because it had not been listed as a recipient.

The means of production are converted into products only after they are worked by men. In other words, production requires a combination of human labor and the means of production. To be able to economize on labor or produce a maximum of goods by a minimum expenditure of labor, an enterprise must be granted power to handle its labor force, i.e., to recruit or discharge workers and to use them one way or another as it sees fit. But the present experiments in a number of provinces have effected little change with regard to the system of distributing labor forces. The number of workers to be recruited is decided by the Ministry of Labor. An enterprise has to accept anyone assigned to it and has no right to a free choice. The Chongqing Iron and Steel Plant wanted more male workers, but it was given more women than men. On the other hand, some textile mills asked for more women workers, but they were given more men than women. Totally unqualified people joined the labor force because enterprises were obliged to take on the sons or daughters of retired workers — a policy designed to ensure family income. Under this replacement system, thirty new workers with poor eyesight were recruited by the No. 2 Cotton Textile Mill in Chongqing in 1979. In the same year, to find jobs for middle school graduates awaiting employment, the local authorities directed each industry and each enterprise to provide employment for children of its own workers. Over-staffing has hampered the rise in labor productivity. These practices have worsened the situation. As some people put it: "We used to have five people doing the work of three, now we have seven instead." The attempt to solve the employment problem at the expense of labor productivity retards economic growth.

Enterprises in China have no say on hiring and still less voice on firing. The enterprises under experiment have no authority to cut down their labor forces or dismiss undesirable workers. A woman worker in a certain plant in Wuhu, Anhui Province, damaged her tools in a fit of bad temper in October 1978 and used various pretexts to stay away from work for months on end. When her wages were withheld, she made a scene and even hit someone on the managerial staff. Since the maximum punishment an enterprise under experiment could give any worker was nominal expulsion, she was able to keep her job, an "iron rice bowl," and had nothing to fear. The management could do nothing no matter how she made trouble.

Any enterprise wishing to economize on labor by reducing its expenditure of labor time relative to the socially necessary labor time must choose to produce goods that are needed by society and can best be produced by its production facilities. But the enterprises under experiment have only a limited authority to manufacture goods not assigned by state plans and are far from controlling every link in the production process. A textile mill in Wuhu, Anhui Province set its cotton polyester twill at a price of 2.50 yuan per foot. Sales were sluggish owing to the high price, and stocks began to pile up. The mill wanted to change over to a new kind of fabric that would be highly popular at 1.97 yuan. This called for a slight alteration in the weaving process, i.e., reducing two threads per inch. As in quite a few other cases, the request was never approved. Factories want to produce goods that are needed on the market and could yield much profit, but they are not allowed to do so. Instead, they have to produce goods which they know do not promise good sales or may even bring losses. A metal works in Wuhu, Anhui Province has been incurring a loss of 80 yuan for each ton of the aluminum it had been producing since 1971 according to the state plan.

An enterprise realizes the value of its products through sales. But bickerings between industrial and commercial enterprises have been going on for years. After experiments in economic reform began, the industrial enterprises wanted to sell more goods on their own. But the authorities in charge of allocation of goods and the marketing enterprises wanted to maintain their status as the only purchasers and distributors of manufactured goods or as "government merchants," aggravating the contradiction between the industrial and commercial branches of the economy. The Ningjiang Lathe Factory and the Chongqing No. 2 Cotton Textile Mill in Sichuan as well as the Hongguang Knitwear Factory in Wuhu, Anhui Province received warnings from state purchasers or wholesalers for trying to sell products on their own, coupled with a threat to stop handling their other products. In June 1979, the Wuhu Cigarette Factory sold the cigarettes it put on display at an industrial exhibition in Bangbu, Anhui Province, and got into real trouble. The Sugar, Tobacco and Liquor Company in Wuhu Prefecture, the authorized local wholesaler in these yields, stopped purchasing its cigarettes for 31 days. The factory had to shut down for 29 days because its warehouses were filled with unsold cigarettes. The resulting losses amounted to more than 17,000 boxes (8,500,000 packages) of cigarettes valued at over 11 million yuan, which meant a loss of 7 million yuan to the state in tax revenue and industrial profit.

The present wage system in China is not entirely in line with the principle of distribution according to work. But it was left intact in the economic reforms in the three provinces we covered. The enterprises under experiment continued to go by the national pay scales for workers and managerial staff and had no power to readjust the scales or the actual wages. Few of the leading cadres are being paid according to their posts. A considerable number of young and middle-aged executives, who are both capable and doing important jobs, are paid far less than what they deserve. A young deputy manager of the Hongguang Knitwear Factory in Wuhu, Anhui Province gets a monthly salary of only 37 yuan. He told us: "At one time [such as during the Cultural Revolution] it was taboo to conduct distribution according to work. So workers and cadres did their jobs out of their devotion to the country and the Party. Of course I didn't agree to be a manager for the purpose of getting a pay raise. But is the present state of affairs in keeping with socialist principles?" A manager of the Leshan Paper Mill said that the executives should be held responsible for the poor performance of their enterprises and should be punished with a deduction in their salaries when necessary. But they must first be paid adequately before their salaries could be reduced. Furthermore, he added, it wouldn't be fair to reduce their pay in case of poor performance without giving them rewards for good performance. Some workers promoted to leading posts in workshops had even suffered a loss in income because they were no longer getting some of the workers' benefits. Quite a number of the recently appointed cadres were not really happy with their new jobs.

An enterprise under experiment may draw on some of its retained earnings to issue bonuses. Thus it may control a bonus fund bigger than that in an ordinary enterprise and may distribute it as it sees fit. This shows that it is enjoying its own financial interest in the area of distribution. But it is not yet enjoying enough financial interest to become a truly independent economic entity. On account of this, there is an almost unavoidable tendency to set up an excessive bonus fund and practice some equalitarianism in its distribution. An excessive bonus fund hampers the development of an enterprise, while equalitarianism dampens the workers' enthusiasm. Without being a truly independent economic entity, however, an enterprise cannot see the harm of these practices.

The Price Factor

We have traced the contradictions that have surfaced at every link in the motion of the capital funds of an enterprise undertaking experiments in managerial reform. Actually, pricing is a factor that must be taken into account. This new economic structure we are trying out is bound to be regulated by the law of value to a large extent. According to the law of value, the price of a commodity always tends to approach its value or the metamorphosis of value — the production price. But under the old economic structure, the law of value could hardly perform its regulatory function, and prices often varied far from values. This was particularly true of industry, where things have not changed much so far, presenting a major stumbling block to the experiments in managerial reform. The irrational pricing of industrial goods has produced big disparities in the profit earnings of different industrial branches. Take for instance the rate of profit based on the cost of production. The average rate of profit for all state-owned enterprises in 1978 was 24 per cent. The breakdowns were: 73 per cent for the petroleum industry, 29 per cent for industrial equipment, 9 per cent for agricultural machinery and 0.7 per cent for coal mining. The petroleum industry's profit rate was 100 times that of the coal mining industry. The regulations of the State Council on experiments in managerial reform as well as those announced by provincial authorities in Sichuan provide for three different ratios for profit retention by enterprises in various industries, one differing from the other by 5 per cent. But this was not enough to offset the differences in earnings caused by irrational pricing. This inequality of benefits between different branches of industry account for a lack of interest in the reforms in some trades and made it impossible for some enterprises to start experiments. The Jinhe Phosphorus Mine in Sichuan Province had 5,000 employees. Once cited as an advanced enterprise, it made a profit of only 700,000 yuan in 1978. By the percentage set in the regulations for enterprises under experiment, it would retain only 35,000 yuan of its profits. If it was not going to undertake the experiment, it would keep 250,000 yuan as a bonus fund on the basis of its total payroll. Unless the price of phosphorus was readjusted, the mine could not start the experiment.

The existing price control system is too extensive and too centralized. Rigid prices are set for too many categories of goods. The centesimal watch produced by the Chengdu Measuring and Cutting Tools Factory was produced at only 18 yuan a piece and sold for 50 yuan. If sold at a lower price, the sales would increase by more than 100,000 pieces. Application for a cut in the price, submitted two years earlier, had not been answered. The workers and staff were dissatisfied with this because the factory had started a managerial reform. Warehouses in other factories had long been filled with products which were unsalable because of their high prices. When these factories started the reform, they could no longer tolerate this situation and submitted requests for cutting prices. When the requests were turned down, they decided to cut the prices on their own. The Honghe Chemical Plant in Sichuan Province could not sell its highly-priced chloroform and soda ash, and the unsold stocks made it difficult for the plant to continue production. The authorities concerned turned down fifty requests from the plant for a reduction of prices. After starting the reform, the plant took it upon itself to cut the price of chloroform by 42 per cent and that of soda ash by 50 per cent. The higher authorities issued a circular criticizing the plant for this action. Dispute over prices delayed the marketing of some new products which were of good quality and were much in demand.

When the state took over all the earnings of its enterprises and paid all their expenses, when it bought up all their products and acted as their only sales agent, contradictions arising from the irrationality of prices were hardly discernible. After the enterprises started the current experiments, they began to enjoy their own financial interests and concerned themselves with pricing which had a direct bearing on their earnings or even on their existence. In discussions with us, many executives said they liked the idea of letting the enterprises assume responsibility for their profits and losses after paying state taxes. But they were afraid that under the current pricing system, some enterprises would easily earn much profit, others would make little money no matter how hard they might try, and still others might even be forced out of business.

Other Handicaps

There are a number of other factors affecting profitability. The practice of building an enterprise as "a society in itself" is unsuitable for modern industrial production, but many enterprises cannot help doing so. For instance, there is a hospital across the street from the Anhui Tractor Factory, but it refused to treat any patients from the factory, compelling the latter to set up a clinic staffed by twenty-six people. The factory needed a regular number of sixty more people to meet its other obligations, such as regular militia training exercises, digging air-raid shelters, helping the street committee organize elections, participating in drives to popularize traffic safety rules, taking part in artistic performances and athletic activities organized by the local trade union, and sending militia men and women to patrol the streets. The factory was also assigned to help an agricultural production brigade become a pace-setter, and had to send 150 men and women to work on the latter's irrigation projects for two months each year. The expenses incurred in these activities were all included in the cost of production, and this was one reason why the factory had been operating at a loss for years. In the Leshan Paper Mill in Sichuan Province, ten per cent of the workers and staff on the payroll had to stay away from their regular jobs for participation in such political and social activities. Once an enterprise started to experiment in managerial reform, it was prompted by its own material interests to conduct strict business accounting and were no longer willing to carry such extra burdens. But specialization of social functions is still underdeveloped in China, and so are the public services. This creates another problem for enterprises experimenting in reforms.

In a commodity economy, it is a normal occurrence for capital funds and labor power to flow from one branch of the economy to another as a remedy for any disequilibrium in social production. In our new commodity economy, close-downs and mergers of enterprises and their shifts between different trades will also be specific ways of restoring equilibrium. But for years economic management in China has been conducted mainly by a vertical system of leadership with almost unbridgeable chasms between different industries and trades. There are often insurmountable obstacles in the way of an enterprise trying to shift to another line of business. China's machine-building industry is overextended and some of its equipment and manpower should be shifted to the light industry. But there is much resistance to such a change. The Plow and Harrow Factory in Ningbo, Zhejiang Province was not assigned any production target in 1979. It asked the First Ministry of Machine-Building for permission to produce bicycles and sewing machines but was told that if it stopped working for the ministry, it would not be supplied with materials. The Metallurgical Equipment Plant in Wuhu, Anhui Province, used its idle equipment to produce bicycles and sewing machines without authorization from the Provincial Machine-Building Bureau, which refused to pay the wages of the plant's workers and staff. The plant had to obtain a subsidy from the municipal authorities to tide over its financial difficulties. The No. 1 Radio Factory in Hefei, Anhui Province decided to produce color TV sets in 1980 because of a poor demand for the electronic products it had been making for military use. The higher authorities were very upset about this and threatened to dismantle and take away its equipment. The Ningbo Tractor Plant in Zhejiang Province was designed to assemble 3,000 tractors a year, but it turned out only 900 in 1978 because of insufficient orders. It joined an automobile factory in trial producing 300 trucks of the 130 model in 1979. When it planned to build 1,000 trucks in 1980, the department in charge of agricultural machine-building refused to supply it with the necessary parts and materials.

Surplus Manpower

As mentioned above, there is keen competition between commodity producers as a concomitant of the operation of the law of value. To get the maximum economic results with a minimum expenditure of labor, no enterprise would keep its unneeded hands for a long time. If some enterprises were to close down, merge with others or change their lines of production, their labor forces would yield a surplus for assignment to other jobs. More than 4,800 people were employed by the Chengdu Measuring and Cutting Tools Factory in 1979.

When the factory started business accounting in its workshops and issued bonuses on the basis of recorded work performance instead of discussions among the workers, linking the financial interests of the workers with the economic results achieved in their workshops, practically all workshops complained that they had too many hands and requested to have a total of more than 500 people transferred to other jobs. The director of the factory predicted that once his enterprise became responsible for its own profits and losses, he could cut down his payroll by one-third, i.e., 1,600 workers and staff members. But an enterprise has no power to discharge unneeded people. All it can do is to list the people they want to discharge while keeping them on its payroll. Although the enterprises wish to discharge the unneeded, the country's social security system is still incapable of taking care of the discharged. On the contrary, society compels the enterprises to accept its surplus manpower. Thus the question of finding outlets for the nation's manpower is a matter of concern to governments at all levels. The experiments in economic reform can hardly go any deeper unless this question is solved.

III. Exploring Ways to Develop the New Economic Relations

As stated above, the conflicts arising from the experiments in managerial reform are but a reflection of the contradictions between the old economic structure and the growing productive forces. The experiments have only revealed the contradictions. If we limit the experiments to their present extent or cancel them, the contradictions can be covered up for the time being. But they will remain unsolved and will lead to sharper conflicts sooner or later. Moreover, the new economy is taking shape before our eyes not as an idea but as a living reality. We can see its features, its dynamism and its bright future, and it is hardly possible for anyone to eliminate it. Confronted with contradictions, we should press ahead with the reform and try to solve the contradictions by widening and deepening the experiments. For instance, an enterprise often shares with the state the profits it earns in excess of the previous year's. The bigger the earnings in the previous year, the harder will it be to exceed them by a wide margin. The practice is unfavorable to advanced enterprises. To establish a lower base figure, some enterprises try to conceal their real productive capacities or even deliberately slow down their production for a while. But these are not the faults of the profit retention scheme itself. In our investigations we heard from many that these things would not have happened if the total profit earnings had been taken as the basis.

When enterprises under experiment make their own decisions on what to produce or use their own funds for extended reproduction, they often find it hard to get the necessary equipment and materials. If all capital goods were put on the market and sold as commodities, nobody would have been unable to get things with his money. Will the national and local departments of supplies be abolished? No. All we have to do is to change them to corporations dealing in capital goods. In other words, administrative organs will be changed to enterprises, which would not enjoy a monopoly position but engage in competition. In this way these organs would continue to play an indispensable role in social reproduction.

Some enterprises tend to spend too much on bonuses. This is no proof that the bonus system is a faulty one. In fact, a financially independent economic entity will never spend too much bonus money against its own interests. If an enterprise is responsible for its own profits and losses, it will cease to do anything like this.

If we are to solve such contradictions and overcome resistance to our advance, we must thoroughly study questions connected with the reform. For example, what are the unique features of the commodity economy in China today? How does this commodity economy manifest itself in production, circulation, distribution and consumption? What are the conditions that make it necessary? How will it develop? What are the trends of its movement? What kind of mechanism regulates such an economy? How will it affect the superstructure, including the state system and ideology? We should also study the positive and negative experience of other socialist countries in trying to find a form of economy suited to their development. Here I would like to state my initial views on two points of general concern, which we formed during our investigations.

1. The relationship between economic readjustment and managerial reform.

The present serious imbalances in the national economy are the major stumbling block to our economic development. If the balances are not re-established through readjustment, it will be hard to undertake a managerial reform in any big way. On the other hand, we should also see that the imbalances have much to do with the drawbacks of the present structure of economic management.

It should be admitted that all-inclusive economic planning is impossible in China today because of the low level of her productive forces and social division of labor. Insistence on such economic planning inevitably leads to imbalances. This has nothing to do with the talent, experience or conscientiousness of the planners. The restoration of balances depends ultimately on a thorough reform in the economic structure. But the imbalances are so serious that a hasty and drastic reform at this moment will put too much strain on the economy. Conversely, if we concentrate solely on readjustment and are reluctant to touch the economic structure, the former can hardly be effective. Thus measures of reform should be carried out in cases where they are necessary, where the conditions are ripe or where a further delay would affect readjustment. In other words, readjustment and reform should complement each other.

To remedy the serious imbalances, it is fully necessary for the state to use its centralized administrative authority to force through certain measures of readjustment. There is no other way to deal with the large construction projects under direct state control. But administrative measures of readjustment may not be immediately effective in the case of small and medium-sized projects because of their great number and their complicated circumstances. It would be hard for administrative organs to make correct decisions on the ones to be expanded and those to be cut out. Even if the decisions are made, they may not be listened to. Faster and better results may be achieved through competition, which means automatic readjustment by economic leverages.

Social production must in any case be conducted by definite proportions between the different departments of the economy. In the case of a commodity economy, the proportions are maintained through regulation by the law of value. Marx quoted a classical economist who compared the law of value to an invisible hand. In other words, regulation by the law of value is a social process taking place behind the backs of the countless commodity producers. Using this same metaphor, we may say that a state plan operates like a visible hand in regulating social production. Experience shows that at this stage of development in our productive forces and in our social division of labor, if we want to maintain constant balances through our conscious effort, a state plan should only be a rough, tentative outline, while many of our economic operations have to be regulated by the law of value. Thus there is an objective need for us to regulate our social production by using both the visible hand of a state plan and the invisible hand of the law of value. Acknowledgement of this truth is very important to success in our readjustment and reform. In a general sense, readjustment is also a regulatory process. We need readjustment because of the serious imbalances in the national economy. Readjustment is a major act of regulation carried out by a concentrated effort in a given period of time. This is why we shouldn't neglect to use both the visible and the invisible hand in readjustment.

In simple language, readjustment means cutting down the overdeveloped industries and expanding the underdeveloped ones. One way to expand the latter is for the state to invest in new enterprises. But the principal way lies in tapping the potentials of existing enterprises through technical innovation and transformation. Old plants can be motivated to do this by internal financial incentives generated through economic reform. Li Yantian from the Economic Commission of Sichuan Province told us that the underdeveloped light and textile industries in the province cannot meet consumer needs. But the government obviously cannot spare the money and materials for building new projects.

However, there is much latent capacity in the existing enterprises, and much can be done by way of technical innovation and transformation. A considerable number of the one hundred enterprises which started experiments in economic reform in 1979 belonged to the light and textile industries. When the No. 1 Cotton Textile Mill in Sichuan mentioned above came under experiment, it used its own money to add two new production lines which will increase its dyeing and printing capacity by 30 million meters. Thus the imbalance between the dyeing and weaving processes in the mill was eliminated, its technological level improved, its production expanded, and the variety of its goods increased. Since experimenting in reform, the Worker-Peasant Canning Factory in Daxian County, Sichuan Province carried out fourteen technical innovations, raising its maximum daily capacity from twenty-odd tons to more than forty tons. It also renovated or built eight pieces of equipment to establish a new production line for the processing of export goods. In Anhui and Zhejiang provinces many enterprises in underdeveloped industries also boosted production while experimenting in managerial reform.

The new economic relations, which have helped to expand the underdeveloped industries, will likewise help to cut down the overdeveloped industries. When an enterprise is asked to close down, it usually claims that it is engaged in an underdeveloped line of production. When free competition takes place among enterprises, those turning out poor products in little demand at a high cost will hardly be able to keep themselves going, and it will not be long before competition forces them to close down, merge with other enterprises, or change their lines of products. As stated above, this was what happened to some machine tool plants in Shanghai and Xi'an when they had to face competition from the Ningjiang Machine Tool Plant in Sichuan Province.

2. The relationship between economic reform and political stability and unity.

There is no doubt that maintenance of political stability and unity is a crucial condition for realizing our modernization program. Furthermore, there should be no contradiction between economic reform and the need to maintain stability and unity, for they serve the same purpose. In the final analysis, political stability and unity can only be built on the foundation of an expanding economy and reform is aimed at altering the economic relations so that they may meet the needs in modernizing production. If we are afraid or unwilling to persevere in the reform, our productive forces will not develop speedily for lack of an appropriate social framework. We will be haunted constantly by the specter of want and poverty, and will remain for a long time outside the ranks of advanced countries. This will be tantamount to fostering a bigger crisis, for the accumulation of poverty inevitably leads to turmoil, division, crime and moral crises. Instead of impairing stability and unity, economic reform is just what is needed to achieve enduring stability and unity.

Of course, we should be bold and prudent at the same time when carrying out the reform. We should strive to complete this great and profound social change with a minimum of repercussions. All possible consequences should be taken into account. For instance, there is already a considerable number of people awaiting employment. If a big surplus labor force is laid off during the reform, wouldn't this aggravate the present situation? A big effort has been made to implement the Party's policy on cadres, and many veteran cadres have just been reinstated. But the new economic relations demand a corresponding makeup of cadres. A change in the present makeup will mean that a number of executives who are infirm with age, have no professional expertise and do not know how to run an enterprise will have to leave their present posts. How are we going to make arrangements for them?

One important aspect of the economic reform will be the readjustment of the pricing system. This includes readjusting the price ratios between capital goods. But changes in the prices of capital goods are bound to affect the prices of consumer goods, and this will in turn affect the living standard of the people. How shall we handle this sensitive issue which affects the well-being of every family?

Speaking of the way out for surplus labor power, we must first clarify the question of people awaiting employment. A constant flow of labor power from one department of social production to another is an inevitable concomitant of a commodity economy. Some workers will always be temporarily outside the production process and waiting for employment. This is likewise a normal phenomenon in our new commodity economy. We should develop our social security system to provide the temporarily jobless with the minimum means of subsistence and help them get jobs in other branches of the economy through employment agencies and training classes.

Secondly, to create as many jobs as possible, we should keep in mind the specific conditions in China and make a big effort to develop labor-intensive industries. During our tour, we made a point of seeing leather shoe factories and found the experience highly rewarding. A leather shoe factory manned by repatriated Chinese nationals in Wuhu, Anhui Province, makes a wide variety of men's and women's shoes that are much in demand on the international market because hand-made shoes are preferred in many countries. Work is largely done by hand, and half of the workers are women. A furniture factory in Ningbo, Zhejiang Province, specializes in redwood furniture for export, decorated with inlaid mother-of-pearl. Here too the main operations are performed by hand. We should expand industries like these.

Thirdly, there are numerous other ways of earning a living besides working in a state-owned or collectively-owned enterprise, and we should encourage people to create their own jobs. Individual producers and businessmen should be permitted to operate. There are several thousand individual producers in Wuhu, Anhui Province, more than one thousand of whom peddle marinated duck. They go to the countryside early in the morning to buy ducks, then cook them, and sell them after state-owned restaurants have closed for the night. Marinated duck sold by these private peddlers are very popular, for they are well-prepared, delicious, and a bit cheaper than those sold in state shops. Moreover, duck down can be sold to a down processing factory. So the earnings of one individual are enough to pay for the living expenses of two or three persons. Individual producers have always been quite active in Wenzhou, Zhejiang Province, where peddlers sell vegetables and delicatessen in the streets and lanes, and individual handicraftsmen engage in a variety of businesses such as making and repairing metal pails and bamboo tables, repairing fountain pens and zippers, etc. There are more than one hundred shoemakers in the town, and thirty-six on one street. Most of them make and sell their own shoes. They offer a wide variety of fashionable shoes that are very popular, particularly among young customers. As someone on the town Party committee in Wenzhou pointed out, one shouldn't underestimate the viability of individual producers in our socio-economic life. Finally, some comrades suggested that we should reconsider the policy of "fuller employment at low wages" which we have carried out for years. They wondered whether it wouldn't be better to keep a part of the population out of the labor force. In the early years after liberation, they noted, one bread earner supported several people in a family. Housework was well taken care of and didn't worry the working member of the family. Now in many cases both husband and wife are working and often have to shoulder a heavy burden of household chores. In fact many of those going to work are better suited to housework because of their lack of skills and their physical condition. Of course changes along this line have to be considered on the basis of a readjustment in wages.

Now a few more words on the change in the makeup of the executive personnel necessitated by the economic reform. It is clear that competition will develop everywhere as our enterprises become commodity producers. If the leaders of an enterprise fail to adapt themselves to the quick tempo of competition and lack the abilities of business executives, the interests of the enterprise are bound to be affected. Thus cadres who are infirm with age, have no expertise and do not know how to run an enterprise will not be equal to their responsibilities of leadership. A reinstated veteran cadre with a relatively high rank was assigned to be a leader in the No. 1 Radio Factory in Hefei, Anhui Province, in 1979. He had not been working for years and was ill-adapted to the post because of his poor health and insufficient ability. He admitted that he couldn't remember what was said in a document if he had read it only once, and would develop a headache if he tried to read it thrice. He depended on an assistant for everything. Such a cadre could not even handle the routine business of a factory, let alone conducting competition. In discussions with us, many people expressed the view that veteran cadres like this factory leader should step down and retire, though they might be provided with the same or even better amenities after retirement.

It is inevitable that the prices of consumer goods will be affected by changes in the prices of capital goods. But the irrational prices of the latter have to be readjusted as a matter of crucial importance. Effective measures must be adopted to cope with the consequences on consumer goods. In the case of such necessities as grain, cotton fabrics and fuel coal, the state should continue to subsidize their sales to guarantee the fulfilment of people's basic needs. But it will be hard to avoid gradual rises in prices. If the rises are offset or more than offset by wage increases, they will not affect social stability.

The structural reform of China's economy will blaze a trail that leads to modernization. Much remains to be done in both practical work and theoretical research. The issues should be explored by people of different views through serious discussions.

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—Translated by Chen Hui

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ECONOMIC PLANNING

GUANGDONG'S PROBLEMS IN LIGHT INDUSTRIAL DEVELOPMENT AIRED

Guangzhou XUESHU YANJIU [ACADEMIC RESEARCH] in Chinese No 6, 1980 pp 5-11

[Article by Wang Anmin [3769 1344 3046], Li Chengxin [2621 2062 2450], He Guiling [0149 6311 3781] and Zhao Renhai [6392 0117 3139]: "Some Problems in the Development of Light Industry in Our Province"]

[Text] I. Slow Development of Light Industry in the Province and Its Causes

Guangdong has a long history of light and handicraft industries. Way back in the 1870's, the phrase "sundry goods of Beijing and Guangdong" was already in popular use. Under the domination of imperialism, feudalism and bureaucratic capitalism before liberation, however, the market was flooded with foreign goods and the light and handicraft industries in the province were brought to the verge of extinction.

After liberation, thanks to the leadership and support of the party and the people's government, light and handicraft industries in our province underwent a great change, and by the end of 1979, after some 30 years' efforts, we had more than 14,600 light industrial enterprises with 1.22 million workers. The gross and net values of fixed assets amounted to 3.845 billion and 2.528 billion yuan respectively. The total output value was 11.97 billion yuan and the progressive annual increase during the past 30 years was 10.6 percent. In 1979, the total output value of light industry was 19.8 times that of 1949. In 1978, the value of goods delivered for export was about 1.5 billion yuan (Renminbi), being 50 percent of the total amount--3.02 billion yuan--of agricultural products procured for export. In the past 30 years, Guangdong's light industry provided about 40 billion yuan's worth of commodities for the market within and outside the province, and contributed more than 15 billion yuan to the state's accumulation funds. This amount was 14 times that of state investments in capital construction for light industry during the same period. The accumulations handed over to the state from this source amounted to one-third of the total provincial financial revenues.

Yet the growth of light industry in our province has been erratic during the past 30 years, and the general tendency has been toward a continual decline in the rate of growth. The growth was fairly rapid during the First Five-Year Plan and the period of readjustment in 1963-1965. The rates of growth were then 15.5 percent and 14.8 percent respectively. During the Second Five-Year Plan, the rate was only 3.8 percent, and continued to decline after 1966. The rate of growth was only

8.7 percent during the Third Five-Year Plan, 7 percent during the Fourth Five-Year Plan and 5.7 percent during the first 4 years of the Sixth Five-Year Plan. What is particularly noteworthy is that after 1977, the growth of light industry in Hubei, Hunan, Jiangsu, Shandong and Fujian was very rapid, while Guangdong remained backward throughout all these years. From 1977 to 1979, the national rate of light industrial growth was 11.5 percent; that of Hebei, 16.5 percent; that of Hunan, 14.7 percent; that of Jiangsu, 14.3 percent; that of Shandong, 13 percent; that of Fujian, 16.8 percent; while that of Guangdong was only 6.1 percent. The backwardness of our light industry is shown by not only the rate of its growth, but also the outdated equipment and technology, the poor quality of products, and the scarcity of new products, designs and varieties. All this has a direct bearing on its competitive power in the domestic and world markets. Unless there is some change and improvement, many products will inevitably be eliminated from the market.

Why has the rate of light industrial growth in our province continued to decline, and why has light industry in our province been so backward, particularly since 1977? The main causes are as follows:

First, investments in light and heavy industries are irrational as shown by the heavy investments in heavy industry and the continually reduced investments in light industry. During the First Five-Year Plan, the proportion of investments in light industry amounted to 16.32 percent, and the investments in heavy industry amounted to 15.78 percent of the total investments in capital construction. The investments in light and heavy industries amounted to 8.47 percent and 44.76 percent during the Second Five-Year Plan; 5.21 percent and 42.14 percent during the Third Five-Year Plan; and 5 percent and 45.76 percent during the Fourth Five-Year Plan respectively. From 1976 to 1979, the proportion of investments in light industry for the whole country in the total investments was 6.5 percent, out of which 6.4 percent was for Hunan, 8.8 percent for Jiangsu, 6.1 percent for Shandong, 10.1 percent for Fujian, and only 4.2 percent for Guangdong. Insufficient investment is the cause of dilapidated workshops, outdated equipment and crude technology. There are now 560,000 square meters of dangerous buildings, or 15 percent of all workshops being used by the light and textile trades in the province are considered dangerous. Of the 271,000 sets of equipment mainly used by the Guangzhou Municipal Second Industry Bureau, 30 percent are due to be written off. In the weaving trade, metal-wooden looms still account for 5 percent of the total number of looms; in the knitting trade, more than 70 percent of the total equipment was used during the 1930's and 1940's; and in the process of printing, dyeing and desizing towels, wooden rods and vats are still used. Many enterprises in the pottery trade are using such primitive methods of production as drying under the sun and refining clay with animal power. That is why most of our light and textile industrial products are of high production costs and poor quality. Hence their slow development.

Secondly, capital construction in the light industry has been blindly carried out instead of being adapted to realities. Many projects were rashly started without considering the material and technical factors or the economic results. The result is serious waste. From 1970 to 1973, for example, a mass battle was fought for the production of artificial fibers in response to the call for self-sufficiency in clothing. In our province, 49.49 million yuan was invested in the textile trade without considering the source of raw material supply or the technology required. Out of this amount, 27.02 million yuan was invested in the production of artificial fiber, and some 11.1 million yuan was spent in building the Meixian County Artificial Fiber Plant, which, however, could not start operation because of the lack of chemical-industrial raw materials. The construction of Zhaoqing Artificial Fiber Plants has up to now cost some 11 million yuan. Since it fails to measure up to the required standard economically and technically, it has to suspend its operation, and now we have to spend 350,000 yuan annually in paying the wages of its 450 workers. In 1976, again, without striking a balance between production and material resources, the First Light Industry Bureau used 78 percent of the total investments in building sugar refineries. Thus in Hainan Island, the Jiazi Refinery of Qiongzhong County, the Tanniu Refinery of Wenchang County, the Gancheng Refinery of Dongfang County, the Dafeng Refinery of Changjiang County, and the Lincheng Refinery of Lingao County made their appearances after a total expenditure of 23.1 million yuan. When these projects were completed, there was a shortage of sugar canes. During the pressing season of 1979-1980, the Tanniu Refinery of Wenchang County had only 16.55 days of pressing operation, pressed 8,124 tons of sugar canes, produced 998 tons of sugar, and suffered a loss of 171,800 yuan. The other refineries also had similar experiences. For example, their number of days spent on the pressing operation were: 21.1 days for Juazi Refinery, 22.08 days for Dafeng Refinery, 89.9 days for Lincheng Refinery, and none at all for Gancheng Refinery. With the exception of Lincheng Refinery which made a profit of 340,000 yuan, all the rest suffered a total loss of 560,000 yuan in 1979. The same situation existed in the Baoan Refinery. After spending 6.71 million yuan on its construction, this sugar refinery had to switch to another line of production because of the lack of sugar canes to keep its original business going. Many other light industrial projects have been blindly started or duplicated without any consideration for the sources of raw materials or economic results. There has been also great waste in the operation of canning factories, tobacco plants and soap plants, for example, because while the large ones are operating under capacity, more and more small ones are being built. All this has adversely affected the speed of light industrial development in our province.

Thirdly, since more than 60 percent of the raw materials for light industrial production in our province come from agriculture, agricultural development has a close bearing on light industrial development. Practice in the past 30 years has proved that whenever the situation in agriculture is favorable, light industrial production develops more quickly. Agricultural development was fairly rapid during the First Five-Year Plan and the 1963-1965 period; so too was the development of light industry. During the First Five-Year Plan, the total agricultural output value increased at an average rate of 6.4 percent, and the total output value of light industry increased at the rate of 15.5 percent. From 1963 to 1965, when the total agricultural output value increased at the rate of 14.4 percent, the total light industrial output value also increased at the rate of 14.8 percent. From 1967 to 1976, however, the total agricultural output value was only 1.5 percent each year, and the total light industrial output value increased by only 6.8 percent. From 1977 to 1979, the speed of agricultural growth in the whole country was 6.3 percent, while that of our province was only 2.3 percent, far below the national level. That is why light industry in our province has become so backward.

Fourthly, in the final analysis, the slow growth of light industry in our province has been all along caused by the lack of a guiding thought for the solution of problems in our construction policy. From 1953 to 1957, the provincial party committee took three measures in dealing with the problems of economic construction in Guangdong: First, for agriculture; second, for industry; and third, for export. These measures were very practical for Guangdong and quite justifiable. In 1958, however, the policy of shifting the focus of work to heavy industry during the "Great Leap Forward" upset the proportionate relationship among agriculture, light industry and heavy industry. From 1963 to 1965, the provincial party committee summed up its experiences and paid more attention to light industry. The ratio between the investments in light industry and heavy industry was changed from 1:5 during the Second Five-Year Plan to 1:3.8, and light industry once again developed quickly. During the 10 years of turmoil, particularly after 1970, there was another change of policy with greater emphasis on heavy industry, while agriculture and light industry were neglected. After the downfall of the "gang of four," the time should have been appropriate for summing up our experiences, drawing our lessons, and deciding on a policy of developing agriculture and light industry as our main concern. Yet, because of divergent views among the leaders in our province, emphasis was still laid on the development of heavy industry, while agriculture and light industry did not receive the attention they deserved. From 1976 to 1978, the difference between light industry and heavy industry was even greater, with a ratio of 1:9-10 in investments. The excessive investments in heavy industry over that of light industry showed the seriousness of ideological ossification, or semi-ossification, among our provincial leaders. This is another reason why our province was so far behind some other advanced provinces in the development of light industry in the past several years.

II. Orientation and Focus of Work To Be Determined in Developing Our Light Industry

Proceeding from the economic conditions in our province and in consideration of the requirements for the state and the people's livelihood as well as for export, we are of the opinion that the orientation and focus of work for the development of light industry in our province should be as follows:

First, vigorous development of the sugar, paper and food industries with sugar refinery as the core.

The sugar, paper and food industries are the large components of the system of light industry in our province. These industries have a combined annual output value of 2.04 billion yuan, or 42.4 percent of the total output value of the first light industry system; an export value of 0.26 billion yuan, or 30.6 percent of the total export value of light industrial products; and a yield of 0.82 billion yuan as taxes and profits, amounting to 64.5 percent of the total taxes and profits from light industry. Therefore, the sugar, paper and food industries should occupy the foremost place in the light industry of our province. Their products are urgently needed by the state and the people in their daily life; therefore, they should be vigorously developed.

The sugar industry should be the core in the simultaneous development of sugar, paper and food industries, and we should use it as a means of promoting the other two industries. There is an abundant source of sugar canes in our province to serve as a fairly solid foundation for the sugar industry. Our present annual sugar production capacity has already reached 1.2 million tons, and a fairly elaborate system of equipment manufacturing, production management and comprehensive utilization has been formed. From this, we can see that conditions are very favorable for the development of the sugar industry. Such a development will spur the development of the paper and food industries. Only 30 percent of the bagasse is now used as raw materials for paper making in our province, and the remaining 70 percent is burned by the sugar refineries because of the shortage of coal. If the supply of coal to the sugar refineries can be assured and the ovens for burning bagasse can be converted into ovens for burning coal, then the bagasse can be fully utilized for paper making and for increasing paper output. According to our calculation, there will be 1 ton of bagasse for every ton of sugar produced, and 10,000 tons of bagasse is sufficient for producing 4,000 tons of paper. Thus with approximately 1 million tons of bagasse (in addition to a certain amount of wood), we can produce 400,000 tons of paper. The economic benefits are quite obvious. Furthermore, many food items, such as liquor, canned food, candies and biscuits are partly or mostly made of sugar, and the development of the sugar industry will provide more raw materials for making candies, biscuits and other food items. From the above, we can see that the development of the sugar industry as the core in the development of sugar, paper and food industries should be the main orientation for the development of light industry in our province.

Second, adjustment of the imbalance between spinning, weaving, and dyeing in the active development of the textile industry.

Textile is a major section of light industry in our province, with an annual output value of 1.3 billion yuan, of which 1.19 billion yuan comes from units owned by the whole people. One-fourth of this total output value of 1.3 billion yuan is from exported goods. Yet textile products in this province are still far from adequate for people's needs. After deducting the exported portion and what is required for industrial purposes, the total textile output in our province can provide each person with an average of only 2.6 meters of cloth, which is barely enough for making 1.02 T-shirts. The textile industry should therefore be actively developed to satisfy people's needs and to meet export requirements.

The main problem in the textile industry of our province is the imbalance among spinning, weaving and dyeing, with weaving surpassing both spinning and dyeing. This is a typical case of being "small at both ends and big in the middle." A total of 350,000 bales of cotton and knitting yarn are required in the province, and only 250,000 bales can be produced locally. The remaining 100,000 bales have to be transferred in from other places. There is not a single design-printing factory in the province; therefore, all printed cloths have to come from other provinces. The imbalance among spinning, weaving and dyeing, and particularly the poor finishing facilities after printing and dyeing, have seriously hampered the development of the textile industry in our province with respect to output, varieties, design and quality. Poor finishing facilities after printing and dyeing has been one of the fatal weaknesses in the textile industry of this province. Therefore, effective measures must be taken soon to solve the problem of spinning, and particularly the problem of finishing, in order to achieve a well-balanced spinning, weaving and dyeing.

Furthermore, this province has abundant resources of silk and hemp. It is estimated that 340,000 dan of silk can be produced this year. Since we have achieved as high an output as 1.5 million dan before, there is still great potential to be tapped in this line of business. In 1979, the combined output of jute and bluish dogbane was 2,668,000 dan, which places our province in the highest rank among all other provinces. We should give full play to the strong points of our resources in silk and hemp by giving priority to the production of silk and hemp fabrics in the development of our textile industry and by creating the necessary conditions to promote their production.

Third, strive to develop pottery and orientate it toward the world market.

Pottery ranks first in our province with respect to output, output value, the volume of export and the amount of foreign exchange earned. Therefore, the development of pottery is of great significance in satisfying people's needs and in earning foreign exchange. Furthermore, pottery is a labor-intensive industry, and its development will help solve the employment problem and improve living conditions in the countryside. Our province enjoys great advantages in the development of pottery. First, we have abundant resources of porcelain clay. There are huge deposits of fine-quality clay in all counties of the province. This is an advantage not enjoyed by other provinces. Secondly, pottery production in our province is now fairly well developed on a good foundation. There are pottery factories in 99 percent of our counties, and a ceramic industrial system on a provincial scale is now beginning to take shape. Furthermore, most of our foreign customers in this trade are Guangdong overseas Chinese, and an overseas commercial network is already in existence. This will be of great help to our pottery export by paving the way to the world market. At present, the annual sales in the world market of pottery amount to 1.5 billion dollars, and only slightly more than 0.1 billion dollars out of this amount belong to our country. Therefore, there is a promising future for our ceramic industry if it is orientated toward the world market.

Fourthly, the need for the production of the "three major items" of machinery, and particularly the production of bicycles and sewing machines. Bicycles and sewing machines are both consumer goods and means of production. There is a great demand for them among the urban and rural population, and they can also serve as a means of large-scale currency withdrawal. At present, the output and quality of bicycles and sewing machines are far from adequate for the demand and requirements of the people. While greatly increasing their output, we should also pay attention to the improvement of quality and increase of varieties.

Fifthly, the importance of developing the second light industry.

The second light industry includes metal fittings, garments, leather and plastic products, furniture and artistic work. The so-called "sundry goods of Beijing and Guangzhou" mainly refer to the products of the second light industry and the handicraft industry. One of the special features of the second light industry is its "being small," meaning the small enterprises dealing with small products. They are all small commodities for daily use and there are more than 1 million designs and varieties of them. Because of their small sizes, they are more flexible and their production line can be changed at any time to suit different specifications. Therefore, they have the advantage of adaptability. Despite their small sizes, transactions on them can be large, because the second light industry also has the special feature of "being large," meaning, first, their large output value (the total output value of our province's second light industrial output value being 3.5 billion yuan, or 16.75 percent of the total industrial output value in the province); second, the large volume of their export (the total value of procurement for export in 1979 being 1.12 billion yuan, or 35 percent of the total value of procurement for export in the province); and third, the large amounts of taxes and profits (the annual amounts of taxes and profits handed over to the state being approximately 0.2 billion yuan). From this, we can see that products of the second light industry, though small in size, can make large contributions. Furthermore, second light industry calls for intensive labor and can absorb a large amount of labor power. There are now 3,624 enterprises in this branch of industry, employing a total of more than 264,000 workers and staff members. In 1980, the second light industry provided jobs for more than 40,000 persons. The other special features of the second light industry are that it consumes less energy, requires less investments, and yields quick results and large accumulations. With regard to energy consumption, each unit of electricity can produce an output value of 2 yuan in heavy industry; 6 yuan in light industry as a whole; and 10 yuan in second light industry in particular. From this, we can see that the development of second light industry is of great significance in satisfying people's needs, in increasing accumulations and foreign exchange earnings for the state, in energy conservation, and in providing job opportunities.

III. Important Measures for Accelerating Light Industrial Development in Our Province

Our province has many favorable conditions for developing light industry. The main ones are as follows: First, the location of our province in the tropical and subtropical zones are climatically suited to the growth of cash crops. Secondly, our proximity to Hong Kong and Macao and the large number of overseas Chinese are helpful to our economic activities abroad. Thirdly, there is a fairly good foundation for light industry in our province. Yet there are also unfavorable conditions and even shortcomings. The unfavorable conditions are as follows: First, the area of Guangdong is small; its population is large; and self-sufficiency in grain is difficult. There is therefore a serious contradiction between grain and cash crop developments. This contradiction, if not satisfactorily resolved, will seriously restrict the sources of raw materials for light industry. Secondly, our province is not resourceful in energy, and the shortage of fuel and power is keenly felt. This shortage will certainly affect the supply of fuel and power for light industry. Thirdly, no cotton is produced in our province, and the industry of chemical raw materials is still undeveloped. In fact, our chemical fiber industry has not even got started. For this reason, the development of textile, plastic and chemical industries, which depend on cotton and chemical products as raw materials, will be restricted. Fourthly, most of the light industrial products in our province are of inferior quality, and there are not enough varieties and designs. Therefore, without the required competitive power, they can only be sold at low prices and earn only little foreign exchange. These are also the shortcomings of light industry in our province.

In order to take full advantage of the favorable conditions and to overcome the unfavorable ones, we should solve the following problems:

First, we should positively insure the required fuel and power supply for light industrial production. Fuel and power are important factors for light industrial production and expanded reproduction. In the past 2 years, the serious shortage of fuel and power forced many enterprises to suspend their business or to operate at half capacity. A great deal of productive capacity was thus wasted. In the first half of 1980, there was some improvement in the fuel and power supply, and light industry, particularly the second light industry, had a higher output than that of the same period in 1979. From January to May 1980, the second light industry increased its output by over 23 percent over that of the same period in 1979. Should there be continued assurance of fuel and power supply for light industrial production, this industry can certainly develop rapidly in our province.

Secondly, the structure of agricultural production should be readjusted and effective policies and measures should be adopted to protect the source of agricultural raw materials. There must be sufficient supply of these raw materials before the rapid development of light industry can be assured. Therefore, the structure of agricultural products should be readjusted, and the former practice of "producing only grain" should be changed, in order to adjust the relationship between grain and cash crop production. Thus rational arrangements should be made for the production of grain and such cash crops as sugar canes, silkworm cocoons, hemp, tobacco and fruits. Provided sufficient land has been allotted for growing grain, we should positively determine the acreage for cash crops, and give active support to the growing of cash crops in centralized areas. At the same time, we should adopt effective policies and measures to arouse the peasants' enthusiasm in developing cash crops, and in setting up fairly stable raw material bases for sugar canes, silkworm cocoons, jute, bluish dogbane, tobacco and fruits. To set up good raw material bases, we should give overall consideration to the interests of the peasants in both grain and cash crop areas, formulate correct policies for prescribed purchase and procurement quotas, grain ration policies, price policies and policies of reward and punishment. We should respect the decision-making power of production teams in planning their own production, so that they can allocate their land for grain and cash crops according to the natural conditions. The families of commune members should be encouraged to plant cash crops or to carry out sideline production related to cash crops. At the same time, there should be an integration of industry and agriculture so that the state-run industrial enterprises will be integrated with the peasants in the raw material producing areas. In this way, we can certainly set up good raw materials bases.

Thirdly, the improvement of quality and increase of varieties of products should be our first concern. We should actively replace our old products with new ones, increase the designs and varieties, and improve the packing. In developing light industry in our province, it is certainly necessary to increase the output of products. However, for a long time, the leading economic organs have stressed only output value and paid no attention to the quality of products. This has been the cause of the poor quality of our products; the stockpiles of old products and the scarcity of new ones; the large number of low-grade and the scarcity of medium- and high-grade products; the large volume of primary processing, and the scarcity of precision work; and poor designs and packing. That is why the light industrial products of our province are unsuitable for the market at home and abroad, have poor competitive power, and can only be disposed of at low prices with little foreign exchange earning. Some foreign trader said: "You have first class raw materials, second class products, third class packing and fourth class price." Quality, designs, varieties and adaptability to the market are the vital factors of light industrial development. If we fail to improve the quality of products, to replace the old varieties with new ones, or to raise them to higher grades, we will not be able to increase their competitive power, and the future of light industry in our province will be a bleak one.

Fourthly, we must tap the potentials of existing enterprises and renovate or transform their equipment at an even higher speed. There are now more than 14,000 light industrial enterprises in our province with a fairly good material and technical foundation. This should serve as a base for our further advance. But the problem is that these are all old enterprises with outdated equipment, old work process and backward technology. Yet there are strong potentials to be tapped just because of this. As long as we tap their potentials, renovate and transform their equipment and replace their backward technology and work process with advanced ones, fill the gaps in their equipment and strengthen their weak links, we can certainly expand their productive capacity by a wide margin. The development of light industry in our province, which requires less investment but yields quicker results, will show very remarkable economic effects.

Fifthly, we have to protect, respect and promote the system of collective ownership. For many years, the system of collective ownership in the cities has not been protected, respected or promoted because of disruptions from the ultra-leftist line. Government offices and economic administration organs at various levels have arbitrarily requisitioned collectively owned properties and funds. The allotted quotas and tax rates are too high, but in the supply of funds and raw materials, or the grant of loans, collectively owned units do not receive the same consideration as given to units owned by the whole people. This has caused very serious damage to the urban collective economy, which now exists in name only.

Urban collective economy is an important factor in the development of socialist economy. We are of the opinion that the system of collective ownership should be protected, respected and promoted in the cities. Therefore, all collective properties which have been indiscriminately requisitioned should be returned, and there should be no more such requisition in future. Government organs at various levels can levy taxes on collectively owned enterprises or supervise their payment of taxes only according to established rules and regulations, and those small collectives which have been improperly transformed into large collectives, and those large collectives which have been improperly transformed into units owned by the whole people should all be allowed to recover their original status. Collectively owned enterprises should truly assume responsibility for their own profits and losses, and the system of taxation for collectively owned units should be changed according to the notice issued by the Ministry of Finance under the State Council. Collectively owned units should be entitled to the same treatment as given to units owned by the whole people in financial support and material supply with no unfair discrimination whatsoever. It will then be possible for the system of collective ownership to pay its full role in socialist modernization.

At the same time, we should take full advantage of the favorable conditions of our proximity to Hong Kong and Macao, and the number of overseas Chinese in our province to further develop such economic activities as processing and assembling of products with materials or specifications provided from abroad. Needless to say, this is an important measure which cannot be overlooked in the development of light industry in our province.

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NEW POWER STATION MARKS BEGINNING OF GEOTHERMAL DEVELOPMENT

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[Article by Wu Chuanlin [0702 1557 2651] and Liu Jinsheng [0491 6855 5116] of the Power Construction Research Institute of the Ministry of Power: "Experimental 1000-Kilowatt Geothermal Power Facility at Yangbajain in Xizang"]

[Excerpts] In September 1977, a 1000-kilowatt geothermal generator began operation at the geothermal field in Yangbaijain on the Xizang Plateau. The generator produced 1.06 million kilowatt-hours of power in 1978, and 2.9 million kilowatt-hours in 1979. Its stable output was about 500 kilowatts, and hit a peak of nearly 700 kilowatts. This is China's first experiment in utilizing high temperature geothermal steam and water mixtures to generate electricity. It has created a new way to meet energy needs in the Lhasa area in Xizang.

I. General Situation of the Geothermal Fields at Yangbajain

About 90 kilometers northwest of Lhasa between the Tangshan Ridge and Nyainqen Tanglha Mountain, which is covered by snow year round, is a long, narrow basin. Its southeastern part is the famous Yangbajain geothermal field. The topography here is flat. It is about 4,300 meters above sea level and its average annual temperature is about 10°C, and is in the high, frigid zone. In the basin, the intermontone accumulation, moraine, and the Tertiary and Quaternary glaciofluvial deposits are 300 to 400 meters thick. In the geothermal field, the post-Mesozoic granites and volcanic extrusive rocks form the base of the basin. This is a downthrown tectonic basin between mountains (Figures 1, 2) [not reproduced]

According to electric surveys and measurements, the thermal field established by the smallest resistance value of the 10 Ohm-meter ring is about 8 square kilometers (2). Gravel or silicoide and calcareous gel structured "mineral spring gel gravel stone" form the surface layer of the geothermal field. The surface layer is 10 to 20 meters thick. Under it is a discontinuous cap rock layer of 10 to 20 meters thick containing icy water and mud and fine mud. Further down are sandstone and gravelstone layers with a muddy gravel layer sandwiched in between. Changes due to erosion by heat and water are visible. They form a depository layer of heat that is not deeply buried. In the thermal field are many hot springs, boiling springs, fumaroles, hot water swamps, and steaming ground surfaces--all indications of the geothermal surface. When exploratory drilling is done down to a depth of some 30 meters, steam and water mixture of over 140°C jets out. Between 70 and 130 meters, the highest temperature measured reached 170°C (Figure 3) [not reproduced] According to calculations, at a depth of 1100 meters, there may be another heat depository layer at temperatures of above 200°C. Estimating from the amount of surface heat flow, explainable reserves of the Yangbajain geothermal field are between 143,000 and 179,000 kilowatts (1.3).

According to the results of exploration conducted in 1976, the design conditions for the 1000-kilowatt generator are:

Nature of geothermal flow	Mixture of steam and water
Temperature	145°C - 165°C
Saturation pressure	4.24 - 7.15 jin/centimeters^2
Weight ratio of steam and water	10 - 20 percent
Ratio of volume of noncondensing gases and steam	1 percent.
Number of producing wells	2

The Zangbuqu River that flows through the geothermal field has an abundant flow and the water is clear. The melting snow of the high mountains flows into the river. The annual average water temperature is lower than 10°C.

The design has taken this range of variation into consideration and provisions have been made so that the generator can still produce 1000 kilowatts of power under the worst conditions.

The Thermal Power System and Efficiency

To rapidly build the power station so that it can produce as quickly as possible, the design of the 1000-kilowatt generator used a relatively simply power generation plan of the expansion method requiring one-time separation of steam, and at the moment, high temperature hot water is not used. The station is based on the water in the Zangbuqu River. Direct flow open hydaulic cooling system is used. The computed output is 1,060 to 1,480 kilowatts. The flow of steam and water mixture required is 67.5 to 155 tons/hours.

The steam and water mixture is supplied by two geothermal wells to the 1000-kilowatt generator. The steam and water separator is located near the mouth of the well. The steam separated is channeled to the power station via a pipeline of about 450 meters long. Hot water is drained from the bottom of the separation and steam enters a collector on the side of the power station building. It is then dehydrated and its dryness is raised and then it is sent into the steam turbine engine to work and to drive the generator to generate electricity. The exhaust steam is channeled into a mixed condenser to come into direct contact with the cooling water and condensed. The mixed water is then drained into the lower reaches of the Zanbuqu River through the bottom of the condensser (Figure 4) [not reproduced].

The designed percentage of power consumed by the plant of the power station is 11.14 percent to 15.6 percent. At present, the actually installed total power consumed by the plant's facilities is 298 kilowatts. When in normal operation, this is about 108 kilowatts.

III. Major Thermodynamic Facility

In the 1000-kilowatt power generation installation at Yangbajain, the steam turbine and the generator are rebuilt from the old equipment of the thermal power plant. The rest are newly manufactured products.

The steam turbine is rebuilt from the AK31-2.5 model steam turbine of the thermal gnerator plant produced domestically (Table 1) [not reproduced] Because the temperature and pressure of geothermalsteam are relatively low, the flow is large, the double row speed gradient and the first pressure gradient in the flow channel of the original steam turbine were eliminated and the original six pressure gradients Nos 2, 3, 4, 5, 6, and 7 were retained. The velocity adjuster of the original turbine was not suitable and it was changed to a butterfly adjuster valve. An escape vent is added for protection in case the velocity of the turbine becomes too high. When the steam turbine velocity is too high, the main steam gate is shut, and at the same time, drainage oil press and spring activate the escape vent valve to open and the steam is directly channeled into the condenser. The rebuilt steam turbine is given the model number N1.0-4.2/145, the internal power is 1185 - 1626 kilowatts.

The generator is one piece of theequipment of the system of the original generator. Its model number is 4H-3060/2, and its fixed power is 2,500 kilowatts. To adapt to the conditions of the Xizang Plateau, the output voltage was reduced from 6,300 volts to3,150 volts. The fixed power was changed to 1,250 kilowatts.

After the steam turbine generator was rebuilt, it was subjected to a simulation experiment at the Neijiang Power Plant with steam provided by a boiler. The parameters were set at those of the steam from the Yangbajain well. The generator group achieved the designed power output, and the operation of the escape vent protection and butterfly adjuster valve was normal.

The steam and water separator is installed near the mouth of the well. It is an upright type 5.575 meters high with a diameter of 1.474 meters. It was manufactured by the Lhasa Machinery Repair Plant. The design used spiral tubes and a sufficient natural separation height so that the separator can perform both gravity separation and centrifugal separation. The equipment can treat a flow of steam and water mixture of 75 to 160 tons/hour. The ratio of steam to water is 10 to 20 percent, the dryness of the steam can reach x = 0.99.

The mixed condenser is the upright type with a height of 6,110 centimeters and a diameter of 2,200 centimeters, manufactured by the Lhasa Machinery Repair Plant.

The cooling water is showered through a sieve inside the condenser and comes into direct contact with the exhaust steam from the steam turbine for condensation. The mixed water is drained away at the bottom. Compared to the surface type condenser, the multiple sieve board type mixed condenser has a small differential heat exchange temperature and a higher degree of vacuum can be obtained, beneficial to increasing the efficiency of the generator group. The cooling water is taken from the Zangbuqu River that flows through the geothermal field. The water temperature throughout the year is lower than 10°C. The flow is sufficient and is suitable for the direct flow open cooling system. The condenser has 7 sieve boards inside. When the cooling water temperature rises above 20°C, then temperature of the mixed exhaust water is 31.76 to 39.66°C. At maximum load, the condensed steam vacuum can be maintained at 700 centimeters of mercury, and the maximum amount of cooling water needed does not surpass 320 tons/hour.

The condenser is installed outside the station at an elevated position. The mixed water is drained by itself without using drainage pumps.

During the design, a water jet steam suction pump was selected for use with the mixed condenser as a system. Steam suction capacity is 100 jin/hour. The power of the electric motor of the water jet pump is 40 kilowatts.

IV. Problems in the Operation of the Power Station

1. The Yang No 23 well and Yang No 4 well supply steam and water mixture to the 1000 kilowatt generator group. These two wells are shallow and the extraction of the thermal deposits from the shallow layer is unstable. The steam and water mixture produced are nearly 170 tons/hour. The flow surpasses the designed requirements but the temperature and steam and water ratio is visibly lower than the given designed condition, only between 131°C and 137°C. Therefore, the generator operates on sliding parameters. This is one of the main reasons it cannot reach the designed output.

2. The total amount of minerals in the steam and water mixture produced by the Yang No 23 well and the Yang No 4 well is about 1900 milligrams/liter. When the geothermal water rises from the thermal depository layer through the pipes, part of the steam bursts out forming a steam and water mixture. At the same time, the temperature and pressure drop, and calcium, magnesium and carbonate salts precipitate to form scum on the walls of the pipes of the wells, inside the separator and the steam and water ducts. The speed of forming scum inside the pipes of the wells is fast. For example, the pipes of the Yang No 4 well are clogged up after a dozen days of operation, and the yield of the steam and water mixture drops to below 50 tons/hour. To solve this problem, a method of declogging the well by machine is used. A steel pipe of 1.4 meters long with a diameter of 108 centimeters is used with a steel cord and a crank to scrub the inside of the well by pulling the steel pipe up and down to remove the layer of scum.

3. The geothermal steam contains a fair amount of noncondensing gases, mainly HBO_2, H_2S, CO_2. The pH values of the mixed exhaust water from the condenser, the condensed water from steam and the circulated water of the water jet pump are all very low, between 5 and 6, and they show an acidic reaction. At the same time, the smell of hydrogen sulfide can also be detected inside the plant. Corrosion of the water pump, steam and water separator, condenser has already been discovered. After taking measures such as coating with polyethylene, a definite result has been achieved in anti-corrosion but continuous efforts are still needed to find a more effective method.

Over 3 years of operation show that the design, manufacture and installation of the 1000-kilowatt experimental geothermal generator at Yangbajain in Xizang are basically successful and the project has already produced a gain. To do the work well in geothermal power generation, it is important to hasten geothermal work and sink productive wells that meet the requirements. The building of power stations must have a rational plan and reliable foundations for sources of energy.

The 1000-kilowatt generator is the beginning of our nation's development of the utilization of high temperature geothermal fluids for power generation. The thermodynamic system is relatively simple, and hot water of fairly high temperatures is drained away, therefore the efficiency of the power station is rather low. In the future, this generator group should be utilized to complete the originally established scientific research projects to provide a reference for the design of multilevel expansion of capacity or expansion-dual circulation generator groups that possess higher efficiency. In addition, when building new power stations, the comprehensive utilization and back flow measures for the water drained from the power station should be planned well. The efficiency of utilization of geothermal energy should be further increased on the one hand and on the other hand attention must be paid to protecting resources and the environment.

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9296
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ENERGY

CAS DEVOTING EFFORTS TO ENERGY RESOURCE RESEARCH, DEVELOPMENT

Beijing GUANGMING RIBAO in Chinese 1 Oct 80 p 1

[Article by Zhou Wenbin [0719 2429 2430] and Ren Xinfa [0117 2946 4099]: "Chinese Academy of Sciences Devotes Major Efforts to Research and Development of Energy Resources"]

[Text] Under the unified organization and leadership of the Energy Resources Committee specially established by the Chinese Academy of Sciences, nearly 3,000 scientific and technical personnel and academic personnel of over 40 institutes of the academy and universities participated in research work to rationally develop energy resources and conservation techniques. Important achievements have already been made.

Basing its work on the specific circumstances in our nation, this scientific research team absorbed new techniques and new experiences in foreign energy sciences, and compiled a list of over 70 important scientific research topics dealing with techniques of burning coal that conserve oil, produce a high efficiency, and less pollution; utilization of surplus industrial heat; early-stage surveys on waterpower development; the development of bioenergy, solar energy, wind energy, oceanic energy and geothermal energy; combination coal/gas-fired steam power sensation; and studies of the economics of energy technology, etc.

In the course this research, the Chinese Academy of Sciences paid attention to the utilization of the comprehensive forces of various disciplines and techniques, and concentrated studies on the topics of developing energy resources and conservation of energy. For example, during the first phase of scientific research for the Ertan Hydroelectric power station, one of our nation's ten stepped power stations, they organized nearly 100 mid level and senior level scientific and technical personnel of 13 research institutes and schools in Beijing, Harbin, Guangzhou and Chengdu to carry out the work. These scientific and technical personnel came from the various disciplines of rock dynamics, geodynamics, materials sciences, remote sensing technology. They joined forces with the coordinating units to separately carry out stress studies of the site of the dam, stability analysis of the shoulders of the dam, studies of the dynamics of quake resistance of the dam and dynamic experiments and on-site filling experiments of the dam shoulders to show the stability of the region's geological structure and the effects of such natural phenomena as earthquakes, icing and freezing, avalanches, and slides, and mud-rock slides upon the dam, and to provide reference information for water conservancy projects.

Through the active efforts of scientific and technical workers, the Chinese Academy of Sciences has already made a large number of significant achievements in the utilization of energy resources. For example, the Changchun Applied Chemistry Institute successfully developed a new type of far infrared material for use in drying paint, film, food, wood, leather, paper manufacturing, and textiles. It consumes little energy, its radiation rate is high, it is inexpensive, its operation is convenient and it represents capabilities up to advanced international standards. The Changchun No 1 Motor Vehicle Plant experimented with the material in drying paint on the automobile radiators, and its use conserved 60 percent of electricity, the drying of the coating was even, and the working conditions were improved. The Changchun Motion Picture Studio used it to dry motion picture film and conserved 50 percent of electricity when compared to the old method, while production increased by 45 percent.

The Chemistry Institute successfully developed a washer using a carbon fiber compound and solved the problems of leakage,dripping, steaming and running of liquids and gases in sealed pipes of various types of pumps, valves and flanges of high pressure and high temperature pipes used in such industries as petroleum, chemical engineering, power generation, metallurgy and machinery. The institute was awarded the fist class award by the Chinese Academy of Sciences. The Guangzhou Chemistry Institute successfully developed a selective water blocking material of formaldehyde cross-linking patial-hydrolysis polypropylene amide for oil wells used in the exploitation of petroleum. It blocked water but not oil. It was used in the construction of 48 wells at the Shengli Oil Field and the production of crude oil increased by 56,000 tons.

To conserve crude oil, the Acoustics Institute successfully developed an ultrasonic emulsification material for mixing in with heavy oil. It was tested in the open hearth furnace at the Tianjin Steel Mill No 1, and it was proven to conserve about 8 pecent of crude oil after mixing in with 9 percent of water. Furthermore, the content of carbon monoxide in the burning gases was reduced, which is beneficial to environmental protection. The Dalian Chemistry and Physics Research Institute used the oxygen electrode of the multiporous and gaseous scattering-type hydrogen and oxygen fuel battery used in the electrolysis of chlorates and chloro-alkalines to replace the iron grid cathode currently being used. The theoretical electrical potential was reduced from 2.19 volts to 0.96 volts. The amount of electricity consumed to produce one ton of caustic soda dropped from 2,350 kilowatt-hours to 1,500 kilowatt-hours, a conservation of 30% to 40% of electricity.

Zhejiang University, which had earlier made a major contribution by developed the dual water cooled generator recently conducted studies of medium and small sized power generators for large surfaces and large capacity. They successfully developed the 500 kilowatt dual water cooled hydraulic turbine generator and a newer model of the 100 kilowatt dual water cooled generator, conserving one third of copper wire and one half of silicon steel plates and the weight of the generator was reduced by one half.

Recently, the Chinese Academy of Sciences held a scientific research work conference to consserve energy in Dalian. The scientific research topics in energy conservation proposed by over 70 representatives of over 30 institutes, plants and schools were organized and coordinated. The completion of these projects will be a tremendous advance level of our nation's utilization of energy resources.

9296
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ENERGY

NEW TECHNIQUES NECESSARY FOR LARGE SCALE CONSERVATION

Beijing GUANGMING RIBAO in Chinese 22 Aug 80 p 4

[Article by Lin Hua [2651 5478]: "Large Scale Conservation of Energy Resources Can Be Achieved Only by Adopting New Techniques"]

[Text] For the past 2 years, we have conducted some surveys and studies of the industries that consume a lot of energy. A massive amount of facts show that to truly realize conservation of energy and develop energy, scientific techniques must be used to reform the factories and mining enterprises.

I. Solving the Problem of the High Consumption of Electricity by the Chemical Industry In 1979, our nation's chemical industry used 48.34 billion kilowatt-hours of electricity, constituting 17% of the whole nation's total electrical power generated, and it was the industry that used the most in the nation. The process that uses the most electric power is for synthetic ammonia, using over two thirds of that used by the chemical industry. Production of each ton of synthetic ammonia uses 1500 to 2000 kilowatt-hours of electricity. If this can be technically reformed, the potential for energy conservation is very great. For example, at the end of 1974, we proposed a plan to reform the synthetic ammoia plants and presented it to the Ministry of Petrochemical Industry: The constant pressure production of gas should be changed to added pressure production of gas (35 kg/cm^2); the joint compressor should be changed to double high voltage so that the single unit compressor (25,000 tons of synthetic ammonia) can double its output. The total yield should be increased from 250,000 tons to 450,000 tons while the consumption of electricity does not change. The capital required would be only one half of building a new plant and the facilities can be equipped by ourselves. This plan was approved and the Lanzhou Chemical Design Institute carried out the design for the plan. But later the plan was scrapped. Now it seems that this plan is still feasible and it is suggested that it should be tested at two or three large and medium sized plants. After results of such tests are in, it should be popularized at 300 large and medium sized plants to greatly further energy conservation.

II. In the Production of Chemical Fertilizers, the Disproportion Among Nitrogen, Phosphorus and Potassium Is the Greatest Waste of Energy. Our nation's production of chemical fertilizers is third in the world but most are low efficiency varieties and the proportion among n[illegible], phosphorus and potassium is seriously out of balance (1:0.2:0). Even more serious is that according to information provided recently by the Agricultural Ministry, in several southern provinces, one jin of chemical fertilizers produces only an increase of one jin of food grains. This is economically bad. Some provinces do not produce increased yields, there is a lot of damage from diseases and insect pests, and the quality is poor (applying an appropriate amount of potassium fertilizers and phosphorous fertilizers can increase yield by 10 percent to 20 percent). Nitrogen fertilizers are completely converted from energy resources, which is a serious waste.

How can this problem be solved?

1. Increase the proportion of potassium fertilizers. The Qarhan Salt Lake in Qinghai is our nation's only large scale mineral bed of soluble potassium and magnesium salts. The total area is over 5,000 square kilometers. The deposits of potassium chloride is 240 million tons. Potassium fertilizers can be manufactured from potassium extracted by the simplest techniques of the chemical industry. At present, the only difficulty is that the life there is extremely harsh. Therefore, appropriately increasing wages, improving commodity supplies and improving living conditions will help to alleviate the problem.

2. Increase the proportion of phosphorous fertilizers. . The resources of phosphorus are mainly concentrated in the four provinces of Yunnan, Guizhou, Sichuan and Hubei. At present, the low quality phosphorus ore containing 20 percent of phosphorus pentoxide is transported over long distance to various localities throughout the nation and then each locality separately processes the ore with sulfuric acid, causing serious wastes of energy, transportation and capital. It is suggested that this kind of low-quality phosphorus ore be selected at the original locality by plants built at the site and use the rich hydraulic resources in the Great Southwest to generate electricity. The electric furnace can be used to produce yellow phosphorus nearby (the Ministry of Light Industries has already imported complete facilities with the capability to produce 30,000 tons of yellow phosphorus which we can completely duplicate). Then, the yellow phosphorus can be processed into phosphoric acid at the locality and then used with fine phosphorus ore to produce high quality phosphorus fertilizers (the quality can reach about 45 percent). This is a good way to conserve energy, transportation, sulfuric acid and capital.

III. Tremendous Potential Exists for the Comprehensive Utilization of Nonferrous Metal Paragenetic Ores. Given the fact that China has considerable resources of nonferrous metal paragenetic ores, doing the work of comprehensive evaluation, comprehensive development and comprehensive utilization can change one mine into many mines, conserving energy resources, and creating more wealth. For the last two years, Comrade Fang Yi [2455 3015] grasped the comprehensive utilization industry of the three large paragenetic mines of Panzhihua, Baotou and Jinchuan and has made visible achievements. For example, in the resources of the Panzhihua vanadium, titanium and magnetine, except for iron, there are also many kinds of nonferrous metals containing vanadium, titanium, cobalt and chromium, and the deposit is extremely rich. The production process of the Panzhihua Steel Mill can retrieve 61 percent of iron at present, the retrieval percentage of vanadium is 39 percent, but titanium cannot be retrieved. The scientific experiment of the new production flow process being developed now can retrieve 43 percent to 46 percent of titanium.

According to calculations by concerned personnel, the economic, rational extraction of these elements could create 8 to 10 times the value of simple iron smelting.

IV. The Problem of Construction Materials. For the past two years, we concentrated on decomposition outside of the kiln at the Benxi Cement Plant (using the surplus heat of the cement kiln to break down limestone into lime), increasing the production of the cement kiln by about 30 percent. The consumption of energy was not increased, and if this method is popularized, it will have a great effect on energy conservation.

We also looked to new types of building materials, the key ones being gypsum board and compound outer wallboard of cement and foamed concrete, and light framing materials. This uses less energy than is needed for firing bricks and tiles, and uses 50 percent less concrete than is used in slab construction (also conserving energy). Because the new types of building materials weight only 1/3 that of traditional materials, transportation resources are also conserved.

V. The Problem Concerning the Utilization of Petroleum and Coal. At present, our nation produces over 100 million tons of crude oil. Most of it is heavy oil. Only by developing deep processing technology can the rate of effective utilization of crude oil be improved. For example, our nation's Third Petroleum Refinery has 30 years of experience in scientific research and production in the technique of "hydrocracking." The products obtained are over 100 percent of the raw materials, and these products can also be used to produce gasoline, kerosene, diesel oil and heavy oil raw materials using different catalysts and different technologies. If our nation's petroleum departments can popularize the several technologies described above, increased yields equivalent to 20 to 30 million tons of crude oil can be produced each year. This is a very handsome dividend.

Rational development and utilization of coal should emphasize washing and selection of coal. Coking should be done on site so that the coal mines can produce both coke and coal gas. Shipping can be reduced by two-thirds to change the long distance transportation of raw coal, an irrational situation. Providing gas for the cities is a good way to conserve energy and solve pollution. It is high time that these be stressed and carried out.

VI. Problem Concerning Electricity. It is suggested that hydroelectric power by developed in a big way. This is because our nation has abundant hydraulic resources. Comparison of the construction of hydroelectric power stations and thermoelectric power stations (including investment in coal mines) shows that the difference in investment is not big, and hydroelectric power plants do not pollute and the cost is low. The suggestion regarding thermoelectric power stations is: one, improve the efficiency of thermal power; two, develop techniques to conserve the use of water, because Shanxi and Nei Monggol, which have the greatest amount of exploitable coal, lack water.

VII. How Can Energy Conservation Techniques Be Reformed? First, the policy must be clear, during the "Sixth Five Year Plan" era, investment in basic construction should mainly be the rebuilding of old plants. In renovating old plants, priority should be given to energy conservation, with the capital thus saved being used to expand production. The chemical enterprises that waste a lot of energy must pay special attention to energy conservation. Second, the cultural and technical levels of workers must be improved. One cannot imagine workers of a modernized factory who do not have a junior college educational level. The proportion of technical personnel and economic management personnel in the enterprises should be increased. All these are an important guarantee of energy conservation.

9296
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MARSH GAS CALLED REVOLUTIONARY RURAL ENERGY SOURCE

Guangzhou HUANJING [ENVIRONMENT] in Chinese No 6, 30 Dec 80 pp 8-9

Article by Qu Geping [2575 2706 1627] Deputy Chairman of the Environmental Protection Leadership Team Office of the State Council]

[Text] Energy sources have a very great effect on the environment. Modern air pollution was caused by the use of coal as fuel for power. From the 1940's to the 1950's, air pollution grew to be serious, and due to sustained discoveries of petroleum resources and their explanation in large quantities, the direction of fuel for power turned to petroleum. Meanwhile, light industries and chemical industries that use petroleum as their raw material appeared, and a new stage of environmental pollution represented by petroleum pollution began. With the petroleum resource crisis, many countries began to develop nuclear energy, with its ensuing radiation pollution. To date, all major sources of energy developed by mankind are quantitatively limited, while their environmental pollution effects are serious.

Is there a source of energy that will never be used up and will not pollute the environment? This type of energy indeed exists in nature. For example, there are solar energy, wind energy, geothermal energy, tidal energy, bio-energy, etc. These energy sources have been utilized by man for a long time, but due to the limitations of technical and economical capabilities, their scope of utilization is small and their development has been slow, and they have been unable to meet the needs of the rapid development of mankind. As mankind faces the reality of a worldwide energy crisis and serious environmental pollution, emphasis is again given to these ancient resources of energy, always discarded but of unlimited quantity.

The situation with regard to energy resources in China may generally be divided into the following two areas: One is in the industrial regions represented by cities, where coal is the major fuel. A large quantity of dust, sulfur dioxide, and nitrogen oxide is emitted into the atmosphere, creating the so-called coal type of air pollution. The other area is in the rural villages, where the fuel is mainly the direct burning of organic energy, and the effect on the environment

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is manifested primarily by the destruction of the natural ecology. China is the most heavily populated country in the world, and 85 percent of the people live in rural villages. The fuel used in their living is mainly plant stems, leaves, and firewood, which they burn. This form of utilization of bio-energy resources has been carried down from antiquity to the present day. Since the establishment of new China, the state has provided the rural villages with large quantities of coal every year, and wherever there are hydrological resources, small hydroelectrical power stations have been built, thus causing some changes in the fuel structure. Nevertheless, 90 percent of the farmers still use the traditional manner of burning plant leaves and firewood directly. It is estimated that every year the rural villages burn up more than 500 million tons of bio-energy sources. When this is calculated in heat energy, it is close to the equivalent of 400 million tons of coal, putting it in second place in the nation's energy resource structure. When this much bio-energy source is burned up, the fuel needs of the rural villages remain unresolved. With further development of production, continued improvement in the standard of living, and the increase in the population, the fuel deficiency contradiction will become increasingly critical.

This form of direct utilization of organic energy sources produces a harmful effect on the environment. It destroys the recycling of organic matter between crops and the soil. Plant stubble can no longer be plowed back into the fields. The soil's organic matter is reduced, the soil becomes hard, and its fertility drops, [adversely] affecting high and stable crop yields. When the stems and leaves of plants are burned up, the [resulting] deficiency of animal feed prevents further development of animal husbandry. The burning of firewood means that trees are randomly cut down, leading to the loss of water and soil and affecting the development of agriculture and animal husbandry. For these reasons, the direct burning of bio-energy resources is an obstacle to the development of agricultural and pastoral production and to the realization of agricultural modernization.

For the purpose of satisfactorily resolving the problem of the energy needs of rural villages, we started to utilize organic marsh gas, based upon a foundation of scientific experiments. Practice has proved that in rural villages, marsh gas is the most economical and reasonable form of utilizing organic energy sources, the most practical and effective way of resolving the problem of energy needs, and the most positive measure for protecting and improving the environment. In rural villages, garbage, wastewater, night soil, plant stems and leaves, and weeds are put in a sealed tank to ferment and decompose, and a combustible gas with methane as its major component is extracted. The technique used at present to extract marsh gas is mainly fermentation under normal temperatures. The marsh gas tank is constructed of cement, concrete, stone, and brick. The advantage of this type of marsh gas tank is the fact that the production of gas is satisfactory, the management is convenient, the construction costs are low, it is safe to use, the raw materials are easily obtainable and regenerable, and there is no environmental pollution. In China, the technique has been brought from the experimentation to the demonstration stage in rural villages, and a new stage of planning and large-scale extension has begun. According to 1978 statistics, more than 70 million marsh gas tanks had been completed in the nation's rural villages, 21 counties had basically realized marsh gas technology, and 35 million persons were using marsh gas as fuel. This kind of progress, made in the short period of just a few years, is rather a great accomplishment.

In rural villages, marsh gas is beneficial to the nation and its people. The many advantages include the following:

1. A saving of firewood and grass and an increase in income. Less than 50 percent as many plant stems and leaves are used for making marsh gas as for direct burning. For example, the Liangzhu Commune of Yuhang County in Zhejiang used to run 50,000 dan short of firewood every year. Since the marsh gas system materialized in 1978, the commune each year has accumulated several tens of thousands of dan of straw for the market. After this is sold, each household has an average gain of 80 yuan. The cost of constructing a marsh gas tank is about 50 yuan, and so this sum is recovered in less than 1 year.

2. An increase in organic fertilizer, thus promoting increased agricultural yields. Human and animal excrement, garbage, stubble, weeds, etc, contain organic matter. Through anaerobic fermentation in the marsh gas tanks, the portion that is easily decomposed becomes combustible marsh gas, and the portion that is difficult to decompose turns into excellent organic fertilizer. Application in fields has proved that this fertilizer is favorable for soil improvement. It increases fertility and obviously raises crop yields. For example, Wansui Commune in Wujin County, Jiangsu, applied 130 dan/mu of marsh gas fertilizer in 1977, nearly doubling the amount of application in 1976. The unit yield that year showed an increase of 41 jin.

3. Protection for trees thus promoting the development of forestry. Once the marsh gas system is adopted, fuel for daily living is no longer a problem and the phenomenon of willful cutting of forest vegetation stops. The work of afforestation of barren mountains becomes much more effective. For example, in the Hengshan region of Suining County, Sichuan, in the 5 years since the adoption of the marsh gas system, 38.87 million trees have been planted on the roadside of villages, 5 times the total number of trees planted in the 20 years previously. Afforestation of barren mountains amounted to 39,100 mu. The trees have grown into forests and all that greenery provides an appearance of prosperity.

4. Enlargement of source of feed thus promoting the development of animal husbandry. Once marsh gas is utilized, the contradiction between fuel and feed is resolved and a large quantity of stubble and fodder is saved to develop animal husbandry. For example, the Sangzhuang Commune, of Deng County, Henan Province completed its marsh gas system in 1976. Since then, large animals, such as oxen, horses, donkeys, and mules have increased from 2,783 to 3,214 head, an increase of 15.5 percent; hogs have increased from 9,643 to 14,872 head, an increase of 54.2 percent. The development of animal husbandry has further increased the quantity of organic fertilizer, promoted increased crop yields and raised the income of the members.

5. Reduction of labor intensity saves the work force. After the marsh gas system is completed, such odd jobs as cutting firewood, transporting the coal, etc, are eliminated, many people are freed from the heavy toil of domestic work,

and the agricultural labor force is strengthened. For example, in Sanghua Commune, before there was marsh gas 37 percent of the women participated in farm labor; afterwards, the rate of participation increased to 85.5 percent.

5. A supply of inexpensive power accelerates the progress of agricultural mechanization. Using marsh gas for motive power requires little investment and produces fast results. Many regions have constructed marsh gas power stations to generate electricity. According to preliminary statistics, 560 marsh gas power stations with a total of 6,400 horsepower have been built in the rural villages of the nation, and 150 marsh gas electricity-generating stations with a machine capacity of 1,600 kw. A new, inexpensive energy source is thus provided for pumping water, irrigation, threshing, milling, and other auxiliary farm industries. Marsh gas technology is now being developed from providing for daily living to production.

Aside from direct economic benefits, the greatest effect of developing marsh gas in rural villages is the protection of the natural environment for the promotion of the overall healthy development of agriculture, forestry, and animal husbandry. Due to the needs of marsh gas tanks, the construction of latrines and animal shelters is being designed so that the manure may go directly into the tank. The open tank type of toilets has been eliminated, and so have the odors and the breeding grounds for flies and maggots, giving a new appearance to environmental sanitation and improving the health standards of the people. According to a survey in Taoyuan Commune, Wujiang County, Jiangsu, since the human excrement has been directed into the tank for fermentation, the quantity of schistosome eggs has been reduced 68.5 percent and larvae 96 percent. These eggs will not become larvae after they are in the tank for 15 days and will completely die in 26-30 days. Hookworm eggs will all die in 30 days; 71 percent of roundworm eggs will become deformed in 4 months. There have been 3,781 fewer hookworm patients in that commune, and there has been a reduction of 1,764 roundworm victims. The incidence of schistosomiasis in Hongxing Brigade in that commune has dropped 95 percent.

Marsh gas has started many changes in the way of living in rural villages. Due to power generation with marsh gas, there has been extensive development of night schools, broadcasting, television, motion pictures, and scientific experimental activities. It is not only a revolution of fuel, but also an impetus for the development of science and culture in the rural villages.

The bio-resources for marsh gas manufacture are extremely rich. It is estimated that if half of the human and animal excrement and crop stubble (other than that which is used as raw material for feed and industry) is used to produce marsh gas, not only may the fuel needs of every rural household be completely met, but there can also be enough fuel for 800,000 power stations generating 7.5 kw each. The inexhaustible bio-energy resources have pointed out a promising future for the resolution of the problem of power required for living and production in rural villages. As an important item of agricultural modernization, the Chinese Government is in the process of mobilizing a nationwide effort to develop marsh gas systems.
6248
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OIL-WATER EMULSIFICATION APPLIED TO STEELMAKING

Beijing GUANGMING RIBAO in Chinese 19 Nov 80 p 1

[Article: "China's First Experiment in Steelmaking in Open Hearth Furnace Using Oil and Water Emulsification Is Successful"]

[Text] Report by correspondent Zhang Changhe [4545 2490 0735]: The scientific research personnel of the Eighth Laboratory of the Acoustics Institute of the Chinese Academy of Sciences and Tianjin Steel Mill No 1 have successfully developed an emulsified fuel mixture of water and fuel oil. When the fuel oil is mixed with 7 to 8 percent of water, a conservation of 6.5 to 9 percent of fuel oil is possible.

This method of conserving fuel oil is not simply mixing water in fuel and burning the fuel. The way it works is to have the water and oil mixture forced from the narrow opening of the emulsifier spout via a specially built cantilever spring whistle ultrasonic generator, forming a vibrating laminar stream that resonates violently with the spring in front of the spout. Under the action of sonic energy, an emptying explosion occurs inside the fluid causing the water in the oil to separate into small globules. Of these, 90 percent are as small as one fortieth to one fifteenth the diameter of a human hair, and they are suspended in the oil to form an emulsified liquid of water surrounded by oil. It is commonly understood that when the emulsified liquid is sprayed from the spout of the furnace chamber, it forms a mist. After entering the furnace chamber, this mist gasifies and microexplosions occur, and the oil drops are refined again (generally called second atomization). In this way, the fuel oil is burned more completely, producing improved thermal energy and conserving fuel. At the same time, this kind of burning can also eliminate smoke and dust and improve environmental pollution.

To study the effect of the ultrasonic emulsifier, the scientific research personnel of the Eighth Laboratory of the Acoustics Institute went to the Tianjin Steel Mill No 1 and joined the leading cadres, technical personnel and workers to improve the emulsifier and the emulsification process, searching for the past four years for better combustion and better emulsification of fuel oil mixed with water. They exerted strenuous efforts and labor. Ultrasonics specialist Professor Ying Chongfu [2019 1504 4395] and head of the institute Professor Wang Dezhao [3076 1795 2507] frequently went to the Eighth Laboratory to guide the work and show concern for the experiment.

After this research project began, the several coordinating and cooperating units conducted several years of experiments on the open hearth furnace of Tianjin Steel Mill No 1. The entire experiment was conducted in three stages: The preliminary stage in which the design of the emulsification equipment, the technological process, and the effectiveness in conserving fuel were studied. The strategic stage, in which they improved the quality of emulsification, the combustion technology, and thermal engineering testing. And finally, the rather protracted production testing stage. The experiment has proven that when the emulsified fuel is burned in the furnace, the amount of air has to be reduced. When the amount of air is reduced by 11.5 percent, the temperature of the flame can be raised by 20 degrees centigrade, with the steel thus made being of acceptable quality. The ultrasonic emulsifier not only has a low manufacturing cost, its structure is sensible, it is convenient to operate, maintenance is easy, and its processing capacity is also large.

On November 7 and 8, the Ministry of Metallurgy asked the Tianjin Municipal Metallurgical Industry Bureau to hold a technology evaluation meeting in Tianjin. Over 50 representatives from such leading agencies of the State Scientific and Technological Commission, State Planning Commission, State Economic Commission, the Bureau of Materials Allocation and specialists and professors were invited to conduct ministerial level evaluation of this technology of conservation of fuel oil. The specialists pointed out that at present our nation burns a large amount of heavy oil and crude oil a year. If this scientific research achievement can be rapidly popularized, a large amount of fuel oil can be conserved.

9296
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ACTIVE BUT CAUTIOUS READJUSTMENT OF INDUSTRY URGED

Jinan DAZHONG RIBAO in Chinese 10 Feb 81 p 1

[Editorial: "Readjustment of Industry Should Be Actively But Cautiously Carried Out"]

[Text] The important policy to make further economic readjustment and to achieve further political stability and unity is the only correct policy for our present economic and political work. It is an urgent and important duty for the broad masses of cadres and workers on the industrial and communications front of the province to implement this policy resolutely and conscientiously in order to do a good job in the active but cautious readjustment of industry.

Since the Third Plenary Session of the 11th Party Central Committee, the industrial and communications front of our province has earnestly implemented the policy of readjustment, restructuring, consolidation and improvement, and production has developed very satisfactorily. This fine situation can be seen from the gradual progress of industrial readjustment, the change in the ratio between light and heavy industries--as shown by the initial success in reversing the tendency toward stressing heavy industry and neglecting light industry--and the more rational industrial structure. A gratifying start has also been made in reforming the system of economic management. We have gained some useful experience from the widespread use of the regulative role of the market guided by state planning, and from the expansion of the power of decision-making for the enterprises. Both production and business operation have become enlivened. The work of tapping potentials, renovation and transformation among the existing enterprises is now firmly in hand and making good progress, and outstanding achievement has been won in increasing the output of light, textile and electronic industries and in energy conservation. The campaign to increase production and practice economy is deepening, with better quality and increased varieties of products, lower consumption of raw materials, reduced losses and increased profits as the result. Economic results have markedly improved. In 1980, despite the shortage of energy resources and insufficient assignments from the state, a certain speed in industrial growth was still maintained. In the same year, the total industrial output value of the province exceeded that of 1979 by 8.29 percent, and the output of light industrial exceeded that 1979 by 17.26 percent. The proportion of light industry in industry as a whole was increased from 46.7 percent in 1979 to 50.56 percent. All this clearly shows that the Party Central Committee's policy of readjustment is entirely correct.

As long as we exert our efforts to make it a success, the industry of our province will certainly maintain its healthy and sustained growth.

Of course, we have also to be soberly aware of the many serious and difficult problems in our province, and the arduous nature of the readjustment. First, the present industrial structure, the makeup of products and the production and supply of energy are far from adequate, and the contradiction between supply and demand is still quite serious. There is a gap between the new and the old mines in the coal and petroleum industries and a disproportion among extraction, tunneling, reserves and flooding. We have therefore to step up our work on the construction and exploitation of new mines and to strengthen the weak links in tunneling and flooding. For this reason, our energy resources, instead of being increased, may possibly be reduced in the next several years. In the current year, the province will be short of approximately 4 million tons of energy materials. Secondly, the capacity of our processing industry is in excess of the availability of raw materials, while the output of certain products is in excess of social needs. With the reduced scale of capital construction, there will be an increasing number of idle enterprises. In the machinery system of the province, approximately 50 percent of the enterprises are now operating seriously under capacity. The problem of not having enough state assignments also exists in the national defense industry and in the pharmaceutical, metallurgical and chemical industrial trades. Thirdly, there is the problem of duplicated construction, blind development, and small and backward units competing for raw materials with the large and advanced ones. Fourthly, poor quality of products, insufficient varieties, high consumption of raw materials, serious losses, backward management and poor economic results are still the outstanding problems in our industrial production. The main cause of all these problems has been the interference and sabotage by Lin Biao and the "gang of four" in our economic work. At the same time, under the influence of "leftist" thinking which has long existed in our economic work, we have not done enough in analyzing and studying the objective economic laws and the realities of our province. Instead of considering the objective conditions and economic results, we only talked about subjective wishes, and blindly set excessive and impractical targets according to our slogans. This was also an important cause of the problems. Therefore, while looking at the fine situation, we must also be fully aware of the difficulties and problems in our industrial production and the necessity and arduous nature of the job of readjustment, and have a strong determination to make this readjustment a success. Only through such a success can we overcome the difficulties, stand firm, and shift our economic work from a passive to an active position. In an even deeper sense, this readjustment will help us eliminate the influence of the erroneous "leftist" thinking, proceed from realities, and look for a new realistic way for developing our economy.

Readjustment is a positive policy. The readjustment this time means both advance and retreat. From the industrial point of view, the retreat we are speaking of essentially means "closing, suspending, amalgamating and converting" for the processing industry which require more energy and raw materials than we can supply; the curtailment of various expenditures, and the lowering of the targets which have been set too high. The purpose of the retreat is to pave the way for a more smooth advance. Some comrades do not clearly understand the positive side of readjustment and generally think that advance is positive, while retreat is negative. Therefore, they have in mind such thoughts as "excessive to you, but not to me" and "going up instead of going down." Some comrades are reluctant to have the plants, laboriously built up by themselves, subjected to the "closing, suspending, amalgamating and converting" treatment, and are thus laboring under some mental hurdle. The problem of mental hurdle must be thoroughly solved. The way to understand the positive side of readjustment should be found from macroeconomics. In 1980, among the enterprises that were closed, suspended, amalgamated or converted to produce other goods in the province, more than 300 of them have switched to the production of light, textile and electronic industrial goods. This has solved the problem of operating under capacity, enabled a number of enterprises to survive, and increased the output of light and textile products. At the same time, the action of closing, suspending, amalgamating and converting on some enterprises which have produced unwanted goods, consumed too much raw materials, and suffered losses for a long time, can help in energy conservation and the improvement of economic results. From the standpoint of microeconomics, we can see some retreat in certain areas and trades. But from a macroeconomic point of view, this is an advance. While sufficient retreat should be made, if a retreat is necessary at all, during the current readjustment, we must still adopt a positive attitude toward production. Therefore, there should be an advance provided it is needed by the society and conditions are favorable. This is particularly true of the light, textile and electronic industries, and other industries connected with the production of energy and the communications and transportation facilities which must be encouraged to advance in the process of readjustment. The production of commodities now in short supply for the market and people's daily life should also be encouraged during the current readjustment. Therefore, we must take full advantage of the existing industrial base and try every possible way to tap its potentials, to improve the quality of products, to increase the designs and varieties and to greatly increase the output of goods in demand in order to enliven the market, increase the revenues and stabilize the economy.

In the course of readjustment, some enterprises should be closed, suspended, amalgamated or converted. According to existing conditions in our province, enterprises of the following categories should be subjected to this treatment in a planned and systematic way: First, enterprises of doubtful resources. These enterprises have no assurance of the supply of raw and semi-finished materials. Their technology is not up the standard and their equipment for production is incomplete. Their pollution problem is serious, but they do not have the means to solve it. In short, they do not have the basic conditions required for their production. Second, enterprises with excessive consumption of fuel, power and short-line raw materials. Third, enterprises producing stockpiles of unwanted and basically unsaleable goods, and having no prospect of future development according to short- and long-range forecasts. Fourth, enterprises producing duplicated goods of inferior quality by competing with large industries for energy and short-line raw materials. Fifth, enterprises under chaotic management and operating at a loss for a long time. Since the work of consolidation has been repeatedly tried on them without success, these enterprises cannot be expected to improve in the near future. Sixth, enterprises of irrational geographical distribution as viewed in the light of the overall situation. They are causing serious damage to the state's mineral resources and historical sites of cultural value. Aside from the enterprises whose energy consumption is high, and the small enterprises which are engaged in duplicated production or are blindly expanding themselves by competing with large enterprises for raw materials with poor economic results, the focus of readjustment is directed at the machinery industry. In this industry, the readjustment can in the main take the forms of specialization and cooperation, economic integration, and the development of short-line products and other key items, in addition to other forms of organized integration which will give play to their strong points. Heat treatment, electroplating, forging and other service centers can be organized for technological cooperation, and some enterprises can be converted to produce light and textile goods to meet the increased demands. Technical equipment can be provided to increase the production of goods now in short supply, and, based on the world market demands, we can gradually change over to the production of machinery for export. We can also tap the potentials of old enterprises, renovate or transform their equipment, and help the various sectors of the national economy in technical innovation. Through the readjustment, the entire industrial and communications system should strive for the following goals: an industrial structure basically suitable for the level of energy and raw material supplies; the production of goods in demand with better quality and more designs and varieties; better economic results through reduction of raw materials consumption and cost of production, and increase of profits; promotion of economic integration, organized large-scale production, and specialization; and a good training program for workers and staff members so as to step up the work of scientific research and design, and to raise the enterprises' scientific and technical level. In short, it will take several years for the industrial enterprises in our province to form a more rational structure, to promote the specialization and cooperation, to acquire more advanced scientific and technological know-how, to improve their business management and to achieve better economic results.

Since the readjustment of industrial enterprises is a very complex and meticulous task, we must carefully handle all the related issues, particularly the issue of policy. This issue has a close bearing on stability and unity as well as the task of readjustment itself, and party committees and government bodies at all levels should treat it as a matter of great importance. In the course of readjustment, we should reduce the number of enterprises to be closed or suspended and the state burden to a minimum by reorganizing them to produce other goods or by some other suitable measures. We should also pay attention to ideological and political education for the workers and staff members so that they will realize the great significance of the readjustment, show their concern for the overall situation, scrupulously abide by the laws and disciplines, and help safeguard stability and unity.

Since the readjustment concerns the overall situation, more active leadership over it is required. There should be strong leadership over government organs and the industrial sector, and special forces should be organized to carry out the readjustment. In the course of readjustment, we should eliminate the influence of the "leftist" errors on the industrial and communications front in the light of realities and set right and guiding thought for economic work. We should correctly handle the relationship between political and economic work, firmly uphold the principle of "ideology taking the lead," and conduct an in-depth education on the "four firm adherences," and the party's lines, principles and policies, and on the party's glorious tradition of hard struggle, so as to integrate ideological and political work with economic measures and administrative methods. The relationship between readjustment and restructuring should also be well handled. Under the guidance of state planning, we should continue to make good use of the regulative role of the market, allow the enterprises to sell their own goods, expand their power of decision-making, and continue to enliven whatever should be enlivened. At the same time, in dealing with certain new problems that may crop up in the course of restructuring, we should adopt a positive approach according to the requirements of the readjustment by providing the necessary guidance for their solution. We should also carefully handle the relationship between the present and the future by giving priority to the present task of industrial production. The enterprises not receiving any state assignment should on the one hand look for their means of survival and on the other hand undergo the readjustment. The enterprises in a position to increase production should make every effort to do so and thus to increase their income. In closing, suspending, amalgamating and converting the enterprises, we should be firm in our approach, steady in our steps, and take various factors into consideration. There should be overall planning and arrangement, and each trade and plant should be analyzed and classified before action is taken. We must avoid the over-simplified method of "solving all problems with a single formula."

Economic readjustment as a means of promoting the four modernizations is a heavy task which history has given to us. Party organizations at all levels and the broad masses of cadres, workers and staff members on the industrial and communications front should be united as one, and work diligently and steadfastly to make this readjustment a success. Industrial production in our province will then be able to advance steadily in the course of readjustment.

9411
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1980 INDUSTRIAL PRODUCTION IN HUBEI, FUJIAN REPORTED

Output Increase in Hubei

Whuan HUBEI RIBAO in Chinese 14 Jan 81 p 1

[Report: "Implementation of Readjustment Principle on Our Province's Industrial and Communications Front Achieved Noteworthy Results--Total Industrial Output Value Last Year Increased 16.9 Percent Over Preceding Year; Growth Rate of Light Industry Exceeded That of Heavy Industry"]

[Text] In 1980 the industrial and communications front in our province earnestly implemented the principle of readjusting the national economy, reformed the economic management system, and carried out various economic policies, achieving encouraging results in industrial production. The annual total industrial output value surpassed the year's plan by 6.4 percent, an increase of 16.9 percent over the preceding year. Of the output of over 80 main products, the targets of 65 were fulfilled and 46 had an increase over the preceding year. The turnover volumes of passenger and cargo transport had relatively large increases. Short-line goods and the variety of designs and colors increased, the quality of products was enhanced, the growth rates of total profit and profit turned over to the higher authorities exceeded that of the total industrial output value.

Since last year, our province has adopted various measures, readjusted the ratio of light and heavy industries, and speeded up the development of light industry. Leaders at all levels supported the implementation of the guiding principle of the "six preferences" in light industry, giving priority to satisfy the needs of light industry in funds, fuels, and raw materials. Last year, the state's investment budget increased by 5 percent over the preceding year; electric power supply increased by 28 percent; over 400 enterprises that produced low quality goods and suffered prolonged deficits were closed down or merged in a planned manner; the readjusted technological capacity, factory buildings, and equipment were used to produce light industrial products needed by the market. Some heavy industrial enterprises even developed economic unities in a variety of forms, promoting the continual growth of light industrial products. The output value of light industry in the province was 23.5 percent higher than the preceding year, with a growth rate of 12 percent higher than heavy industry's. Its proportion in the total industrial output value increased from 45.4 percent in the preceding year to 48 percent last year.

In the course of readjusting the national economy, all industrial and communications departments in our province emphasized readjusting the structure of products, developed short-line goods, enhanced quality, and increased the variety of designs and colors. To suit market needs, light textile trades concentrated their strength and in a short period of time developed a large number of products including washing machines, electric meters, and knitted coats, increasing the production of high and medium quality goods and durable consumer goods. Compared to the preceding year, sewing machines increased by 83.8 percent, television sets 75.7 percent, and watches 57 percent. The proportion of chemical fiber fabrics among textile goods also increased. Short-line goods of trades in metallurgy, machinery, building materials, and chemical industry had relatively large increases. In prefectures and municipalities as well as industry and enterprises, activities to achieve excellence and attain targets were extensively launched and noteworthy results were obtained. According to statistics, of the targets for quality of 50 main products in the whole province last year, 31 were higher than the preceding year and 10 received state awards with designations of gold and silver grades. Over 130 products were designated high quality, fine, famous, and reliable by various central government departments. New products, designs and colors continued to appear in large numbers. Light textile industry alone experimentally manufactured over 10,000 types. Quite a few products had an overseas market. The total export value of industrial goods increased 48 percent over the preceding year.

Last year on the industrial and communications front of the whole province, relatively good economic results were obtained in strengthening the management of enterprises and in launching a campaign to increase production and economize centering around energy conservation. The total labor productivity was 5.8 percent above record level. The circulating fund per 100 yuan of output value decreased. The cost of fixed products decreased. The actual profit per 100 yuan of output value increased by 67 percent. The consumption targets of main products decreased; the conservation targets of fuel oils, coal, and electricity set by the state were all surpassed.

Fujian Surpasses Plan

Fuzhou FUJIAN RIBAO in Chinese 11 Jan 81 p 1

[Report: "Readjustment of Industry in Our Province Increased Production and Income--Last Year's Industrial Output Value Increased 11 Percent Over Preceding Year; Light Industry Grew 14.3 Percent"]

[Text] In 1980 the industrial and communications front in our province continued to carry out the eight character principle of readjusting the national economy and various economic policies, extensively launched the programs to increase production and economize and to increase income and cut down expenses. Relatively good results were obtained. The annual total industrial output value increased 11 percent over 1979, surpassing the year's plan by 1.3 percent. The profit of state-operated industrial enterprises above the county level increased by 20.8 percent over 1979, fulfilling the financial task of turning it in to the higher authorities 2 months early.

Of the output of the 60 main products listed in the provincial plan, 45 surpassed the year's plan and 39 had increases over the preceding year. Some marketable goods needed in daily use by the people such as television sets and glass panes increased manifoldly. Sewing machines and bicycles increased more than 70 percent, and goods produced to support agriculture made relatively good progress. Chemical fertilizers increased by 25 percent. The quality of products was enhanced and the variety of designs and colors increased. Four products--chengang wine, sensitive paper, rosin, and fox-glove pills--received state awards for their quality; 68 products received provincial awards for excellent quality. The fixed sample passing rate for key products required for checking by the province increased more than 15 percent over 1979. Freight volume by rail, land, river and sea also surpassed the annual plan.

The proportion of output value of light industry in the total industrial output continued to rise. The annual output value of light industry grew 14.3 percent from 1979, greatly exceeding the 6.3 percent growth rate of heavy industry. In the total industrial output value, light industry rose from 59.5 percent in 1979 to 61.3 percent.

Consumption of energy and raw materials decreased and relatively good results were obtained in making up deficits and increasing surpluses. Owing to price increases in raw materials, living subsidy for staff workers, transfer of funds for job promotions, increase in depreciation, and loans for circulating funds, the expenditure of industrial and communications enterprises in the whole province in 1980 was about 15 percent higher than 1979, but actual profit increased by a relatively big margin. Leaders of all levels on the industrial and communications front reinforced financial viewpoints, strengthened the management of enterprises and economic accounting, earnestly paid attention to economization, thereby compensating for the portion of increased expenditure. Economization emphasized energy and raw materials. Compared to the energy consumption of 1979, last year had a savings of 300,000 metric tons of raw coal, 130 million kilowatt-hours of electricity and 20,000 metric tons of oil; meeting the state's demand of 5 percent savings of coal, 3 percent of electricity, and 10 percent of oil. The number of enterprises with deficits decreased by 56 percent from the preceding year, and the amount of deficit decreased by 47 percent or a total of over 22 million yuan.

Under planned guidance, market regulation further developed. Last year some trades had inadequate raw materials and some did not have sufficient tasks. Under the planned guidance of the state these trades developed market regulation, broadened avenues, developed production, and enlivened the economy. At the beginning of the year, a machinery system for the whole province had only about 30 percent of the year's plan in ordered goods. They carried out market investigation, and according to the needs of the society, readjusted the direction of goods; conducted sale exhibitions that had a variety of forms; strengthened the sales of goods; and served the people's living, markets for light industry, and all trades by every possible means. The annual total industrial output value surpassed the original plan and had an increase over the preceding year. Tasks contracted through market regulation numbered around 60 percent.

Reform of the economic management system and implementation of various economic policies promoted the growth of production. Last year, the number of trial units for expanding enterprises' right to self-choice increased to 114 in the province.

Such enterprises generally obtained the desirable results of "the state receiving more, enterprises retaining more, and individuals getting more income." Among the 10 or so industrial enterprises that had an increased profit of 1 million yuan during the first half of the year, 9 were units with expanded rights. The system of awards for industrial and communications enterprises made improvement. The principle of distribution according to work was further implemented. Breaking down into smaller targets and recording points to calculate awards were generally carried out. Enterprises that paid wages according to the quantity of goods produced gradually increased, thus mobilizing the enthusiasm of staff workers.

Although the industrial and communications front in our province in 1980 obtained good results, there were also problems. The state of internal disproportion in industry is basically unaltered. Communications and transportation are becoming short in supply. The phenomena of blind production and redundant construction of factories are quite serious. Management standards of some enterprises are low and economic results are poor. Some goods did not satisfy need, became unmarketable and overstocked, and business losses still exist. In the new year, the industrial and communications front in our province must center around readjustment, keep capital construction under control, pay attention to weak links, resturcture and consolidate enterprises, develop marketable goods, enhance economic benefits, do a good job in industrial and communications production in a down-to-earth manner and contribute to the stabilization of our provincial economy, market prices, and the people's living.

9586
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CONSTRUCTION

NECESSITY OF REDUCED CAPITAL CONSTRUCTION STRESSED

Taiyuan SHANXI RIBAO in Chinese 9 Feb 81 p 3

[Article by Zhao Wensheng [6592 2429 3932], Shi Yingbiao [0670 2019 2871] and Guo Yao [6753 6460]: "There Must Be Sufficient Retreat on the Capital Construction Front"]

[Text] Reduction of the scale of capital construction is the key to the national economic readjustment, and resolute action must be taken on those projects which yield poor economic results and are being built under unfavorable conditions. Yet in the past 2 years, such action did not produce the desired result. No matter how drastic or how mild the action may have been, capital construction investment has continued to rise and has now reached an unprecedented level of more than 2.3 billion yuan. Why is it possible for such a situation to arise? Some people said: "The causes are many, but one of the important ones is probably the foolish acts of well-intentioned people." Facts revealed by investigations have proved the correctness of such a statement.

Some comrades are quite enthusiastic about capital construction and eager to see the areas or units under their jurisdiction modernized in 2 or 3 years. Proceeding from this subjective "good intention," these people hate to see the limited scope of their capital construction, the small amounts of appropriated funds, the low targets and the slow progress. Therefore, they try every way to raise funds for additional investments. While you are "clamping down" on financial appropriations, they are raising funds from bank loans; while you are reducing investments in the budget, they are increasing their extra-budget expenditures; and while you are reducing appropriations for capital construction, they are making use of the funds earmarked for technical innovation. Some units have even the audacity to start capital construction projects before they are sure of the availability of funds and materials. With only 20,000 yuan on hand, they are already proceeding with the building of an exhibition and sales hall with a floor space of 4,000 square meters.

In an attempt to get more projects started, one of the clever tricks used by these "well-intentioned" people is to minimize the amount of investments to be shown in the budget in the hope of obtaining the required approval. For many years, there has hardly been any construction project in which the actual investments were less than the budgeted amounts, while instances of raising cost prices because of insufficient budgeted funds, or, as some people call it, "filling a bottomless hole with money" are only too numerous. The amount of investments as shown in the budget for building a ditch to draw water from Qinhe River for irrigation purposes was only 0.2 billion yuan. However, after the work was started, the estimated amount rose to 0.76 billion yuan. The project of transferring water from the east to the west in Pingding County originally called for 20 million yuan. Now the 25 million yuan already invested is only approximately half of the actually required amount, because this project cannot possibly be completed without a total investment of 40 or 50 million yuan. Last year, new offices were built for the county party committees in a certain prefecture with nine counties. The budgeted investments were all below the actual amounts required. One of the reasons for this situation is that budgets can hardly be accurate; but the more important reason is that the budgeted amounts were deliberately reduced for the purpose of securing the "permit" to start work. People have aptly called this "reduced budgeted amount" a "registration fee," because, as they said, "once a project is registered, people will have no more worry. They will be in a bargaining position after starting work." A certain transportation unit with only 35 people had to build a mess hall for its workers. After approval by the provincial planning committee, this mess hall was converted into an assembly hall with 1,050 seats. People all want to expand their own units, increase their projects, raise their targets and go after additional investments. Thus the capital construction front becomes a "rubber band" to be stretched longer and longer.

Because of some comrades' eagerness to do some "good work" by stretching the capital construction front with every possible effort, the result can only be a gap between available funds and the projects undertaken, and the economic result can never be a good one. Among the projects under construction in our province in 1979 (not counting those directly affiliated to or supplied by the central departments), 1,400 of them called for investments of more than 100,000 yuan each, and the unfinished portion of the construction work still calls for more than 2.88 billion yuan. According to the level of our province's annual spending on these investments, it will take 5 or 6 years to complete these projects even though not a single new project will be added. Although some projects were stopped or postponed, amalgamated or converted to serve other purposes in 1980, the number of projects is actually increasing instead of decreasing. The amount of unfinished construction work in 1980 was more than that of 1979, and the gap in construction materials has become wider along with the extention of the capital construction front. In 1979, the state-supplied steel materials could meet only 80 percent; cement, only 60 percent; and timber, only 40 percent of the demand. In 1980, the steel materials could meet only 74 percent; cement, only 56 percent; and timber, only 38 percent of the demand. Because of the shortage of funds and materials, the construction period has to become longer and longer, and is now doubling that of the First Five-Year Plan period. The building of a machine-tool plant during the First Five-Year Plan required only 3 years; now the building of the same type of plant takes 8 or 9 years. During the First Five-Year Plan, again, the construction of a coal shaft required only 25 months; now it takes 70 or 80 months. In the past, a small power-generation plant could be completed and commissioned in 5 months; now it can easily drag on to 4 or 5 years. Since many projects cannot be completed on schedule, as though there is a protracted "war of attrition" going on, what a great loss to our economy this is! If anyone can calculate this loss, the result would certainly be a staggering one.

At this point, some well-intentioned comrades, who are anxious to do more good deeds for their own areas, departments, or units, may say: "There will be no problem as long as more building materials are produced and more funds are allocated!" These comrades have no idea of the serious consequences. Capital construction funds come from the accumulation of national income. Increased investments in capital construction will inevitably call for increased accumulations in the national income and lead to an imbalance between accumulation and consumption with economic chaos in its wake. Apart from the great hardship of the people and the restriction on production, the loss and waste of state funds can be even more serious. Didn't such a situation appear after the "Great Leap Forward" in 1960? Isn't this lesson good enough for us? Experience has proved that the appropriate rate of accumulation should be 25 percent of the national income. For many years, however, the national rate was higher than this, and our provincial rate was even higher than the national rate. According to statistics by departments concerned, the average rate of accumulation in our province from 1970 to 1978 was more than 35 percent, with the top at 40.2 percent. Unless the scale of capital construction is reduced and this situation is reversed, we will be confronted with the same situation as we were in 1960.

Capital construction funds in the province for the current year have been greatly reduced. What shall we do in the face of these objective facts? The only way is for us to learn from past experiences and to have the determination to cut back capital construction. As to the projects with undetermined geological conditions, sub-standard technology of production, uncertain supply of raw materials, fuel and power, poor prospects of sales, serious pollution problems and doubtful ability to carry on production after completion, we should promptly cancel whatever has not yet been started and postpone those now under construction. Some projects which are economically practical from a local point of view but overlapping with others from an overall point of view, and some small projects which will "compete with large ones for raw materials" should also be halted. Even justifiable projects should be evaluated in the light of available financial and material resources, and their pros and cons must be carefully weighed before we can decide whether or not we are capable of such undertakings. If they are necessary, but beyond our capability, they should still be shelved, because we must not attempt the impossible again. Even the projects already started with good economic prospects and meeting objective needs, should strictly follow the capital construction procedures in order to prevent such erroneous practices as raising the standard of construction, expanding its scope, adding new features and using additional investments without authorization. Experiences have proved that unless these links are tightly controlled, it will be difficult to solve the problem of an over-extended front.

Another important reason why it is difficult to keep capital construction within bounds is that there are too many sources of funds and chaos in fund appropriation in the absence of a unified control system. For the supply of capital construction funds, there are now more than 20 different sources, such as budgeted capital construction appropriations, capital construction loans, special capital construction loans, appropriations for the preservation of postponed projects, loans and appropriations for tapping potentials, self-raised capital construction funds, technical measure funds, compensatory loans, reserve equipment loans, self-reliance loans, special equipment loans, and withdrawals from the treasury to finance added workload. In addition to all these, there are various types of loans from the People's Bank, the Bank of China, and the Agricultural Bank. With so many sources of funds and the lack of a fairly centralized and unified control system, the situation can be likened to a "railway security system in which each policeman is responsible only for his own beat," and it would be very difficult to plug the loopholes in the supply of funds. The lack of control and the failure to curtail the scope of capital construction in the past 2 years is inseparable from the lack of a centralized and unified control system of funds and the existence of chaos and loopholes. Therefore, all capital construction funds, regardless of the sources should be controlled by the departments in charge according to planned arrangements. The planning committees and the capital construction committees at all levels should work out an overall balance and include all projects or different scopes in the capital construction plan. The banks' supervisory role should be strengthened, and all funds for capital construction, for tapping potentials and renovation and transformation of old enterprises (including the medium- and short-term loans granted by the People's Bank) should be under the unified control of the Construction Bank. The scope of all capital construction projects must be kept within the limits of what is permitted by the available funds. Instead of leaving behind any gaps to be filled later, these funds should even include a safety margin.

Ideological and political work should be stepped up in order to eradicate such unhealthy tendencies as going in for grandiose projects, "I go my own way," and failing to follow the capital construction procedures and the established rules and regulations, all stemming from departmentalism. Our failure to reduce the scale of capital construction in the past several years was directly related to the evils of departmentalism. If we do not carry out ideological work well in the coming year, or if we are slow and hesitant and act too late, some people can still go their own way by exercising the power in their hands. For example, as soon as the news of a reduction of capital construction funds is heard, what some people have in mind is not the methods of cooperation, but the idea that "the budget at the beginning of the year is small; the final budget at the year-end is large. This has become a time-honored practice and this year can be no exception." Some other people would say: "The budget provides only several hundreds of millions of yuan. Just wait and see. It will be a miracle if it does not end up with at least a billion yuan by the year-end!" There are still others trying to reclassify the capital construction projects in their own departments as undertakings in tapping potentials and renovation and transformation of equipment, so as to avoid using the name "capital construction" while continuing their original projects. From this, we can see how important ideological work on the capital construction front is!

To implement the spirit of the State Council directive on shortening the capital construction front and to strictly control the scope of capital construction in our province, we must follow the principle of centralized and unified control and work out a set of strict rules and regulations or methods of control suitable for our province. We have had many such rules and regulations in the past, but they were not strict and detailed enough, and not strictly enforced either. To add some construction projects for their own departments or units, some people have tried every way to look for loopholes. Others have disregarded the capital construction procedures and the specific rules and regulations in making unauthorized changes of the features or expansion of the scope of the projects. Instead of being checked on and suitably dealt with, these people were even in a position to bargain for certain additional benefits. Unless there is a quick change of this unsound control system, in which rules and regulations are not followed, orders are not obeyed and prohibitions are ineffective, the shortening of the capital construction front in the coming year will still be futile.

To reduce capital construction to a suitable scope and to use our limited financial and material resources on the urgently needed items, so that due economic benefits can be gained, we have to conduct investigations and study and be prepared for some heavy work. If we act on the basis of what has been reported to us instead of conducting investigations and study ourselves, we will be groping in the dark and may make wrong decisions. Then some projects, which should be stopped or postponed, may be treated as key projects, while others, which should not be stopped or postponed, may be summarily written off, thus causing undue losses.

9411
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BEIJING FOREIGN TRADE UP 40 PERCENT IN 1980

Beijing BEIJING RIBAO in Chinese 12 Jan 81 p 1

[Article by (pen names) Bei Qiang [0554 1730] and Jing Shan [2529 1472]: "This City's Foreign Trade and Exports Grew More Than 40 Percent Last Year"]

[Text] Owing to close cooperation among industrial, agricultural, foreign trade, and transportation departments, this city's exports last year fulfilled 120.1 percent of the state plan. This was an increase in growth of 42.3 percent over 1979, and represents the highest level in history.

The main reason for the high rate of growth in this city's total exports last year is that production departments seriously carried out the measures proposed by the Party Central Committee which had adjustment at the core, such as adjustment, improvement, rectification, and other improved programs, to make comparatively greater progress and improvements than in the past in the quality of export products as well as the variety in types of export goods. This was especially true in the case of light textile industry products, whose purchase growth rates all exceeded 50 percent and resulted in a fairly ample supply of goods for export.

At the beginning of last year, city foreign trade departments began to pay attention to doing work in grasping operations management, concluding foreign transactions, organizing export of goods which had favorable sales markets, and assisting production. In developing new products and organizing new sources of goods, owing to utmost joint efforts on the part of production and foreign trade departments, 19 new product types were set up last year. Export deals have been concluded for 8 of these new products, among which are ladies' high-heeled sandals, reproductions of antique porcelains, fireworks, frozen foods, seersucker cloth, and children's wooden whistles. One new product alone produces more than 1 million U.S. dollars in foreign exchange for the state.

In order to meet the needs of foreign markets, city foreign trade departments also actively utilized local foreign exchange to import raw supplementary materials for which there were market outlets; these were processed into finished goods for export with fairly good results. Arranging for the importing of "PU" simulated leather for processing into finished products for export itself alone returned more than 1.4 million U.S. dollars.

Since the beginning of last year, city foreign trade departments have cooperated closely with production departments in grasping well the work of concluding export deals and raising the rate by which commitments are honored. This has resulted in the rate by which export commitments are honored being above 80 percent.

In order to intensify stimulation of foreign trade sales and expansion of exports, city foreign trade departments, in addition to attending the twice-yearly Guangzhou Trade Fair, successively held many kinds of small-scale trade exhibitions and business transaction conferences in Beijing, involving exhibits of woolen and cotton fabrics, clothing, handicrafts, carpets, furs and skins, and cloth shoes. They also arranged an exhibition for sales promotion abroad and the city moreover started enterprises in countries or districts such as Japan, the USA and Macao which are jointly managed with foreign business interests. All of these measures were effective in expanding exports.

Last year city foreign trade transportation departments cooperated closely with city transportation departments in equitably arranging rail, water, short-haul transport and water-land joint shipments so that while guaranteeing that our city's export mission was fulfilled, these facilities would play their role to the fullest.

9420
CSO: 4006

FOREIGN TRADE

SPECIAL POLICIES, FLEXIBLE PROCEDURES BOOST GUANGDONG'S FOREIGN TRADE

Guangzhou NANFANG RIBAO in Chinese 26 Dec 80 p 1

[Article by Deng Xiuzhen [6772 4423 6297]: "Our Province's Foreign Trade Has Achieved Gratifying Results This Year"]

[Text] Under the motive force of the special policies and flexible procedures, our province's foreign trade achieved gratifying results this year. Purchases and exports both exceeded quotas set by the annual plan one month ahead of time. Up to November, foreign trade purchases provincewide had achieved 109.7 percent of the total planned for the entire year, an increase of 24.6 percent over the same period of last year; exports from Guangdong ports achieved 107.9 percent of the total planned for the year, an increase of 25 percent over the same period of last year. Both purchases and exports surpassed highest previous historical records.

So far this year, party committees and governments at all levels in our province have gone a step farther in tightening leadership over foreign trade work by showing interest in foreign trade, supporting foreign trade, and assisting in resolution of problems encountered in foreign trade work. Particularly owing to the adjustment in the national economy, farm village policies went a step farther toward implementation and industrial and agricultural production nationwide developed steadily. It afforded a trend where the provision of resources for goods for export improved daily and this provided a reliable material base for this year's foreign trade.

In order to raise the level of our province's foreign trade, the broad cadres and staff and workers in the foreign trade system went a step farther in liberating ideology, and vigorously stimulating business. They paid attention to giving full play to advantageous conditions in Guangdong, carrying out the "take entering (goods) and create exports" plan on a large scale by externally organizing the processing of imported raw materials for export. For several products whose production difficulty factor was great and for which the export market was good they used various measures such as single-item foreign exchange allotments, negotiated prices, purchase exchanges, and suitable increases in supported commodities and at the same time they have equal consideration to the domestic marketplace by acting in the best interests of departments which supply goods, leading to more production, more purchases, and resolution in a comparatively better way of problems concerning a shortage or resources for several export products.

In the area of exports, staff and workers of the foreign trade system emphasized the mastering of the requirements and trends of the international marketplace, organizing and managing production and exports in a timely fashion to bring about an unending increase in export of products suitable for sale abroad. They raised the competitiveness of these products and exacted good selling prices. They also enthusiastically cooperated with all concerned departments in developing all types and forms of trade activities and producing more foreign exchange for the state.

9420
CSO: 4006

FOREIGN TRADE

SHANXI PURCHASES, EXPORTS HIT RECORD HIGH

Taiyuan SHANXI RIBAO in Chinese 18 Jan 81 p 1

[Article by Xu Jing [6079 7231], Provincial Foreign Trade Bureau Communications Group: "Foreign Trade Purchases and Exports of Our Province Set Best Records in History"]

[Text] In the past year, both foreign trade purchases and exports in our province exceeded planned quotas and set the best records in history. Changes occurred in the export product structure, with close to 100 types of industrial and mineral products being added in one year. The percentage of total value which is attributable to purchases reached 78.6 percent. There was more than 5 million yuan in single-item (purchases) of "fist merchandise," representing an increase in development from 4 such items in 1976 to 17.

According to statistics at the end of 1980, foreign trade purchases provincewide totalled 472,780,000 yuan, or 149 percent of the planned amount for the year, representing an increase of 41 percent over last year. Direct exports totalled U.S.$15.13 million, or 108 percent after adjustment to the annual plan, and represented an increase of 13.9 over last year. Additionally, with approval of the state, our province increased planned export of self-controlled special item coal by 1 million tons during the period August 1980 to June 1981; 280 thousand tons of this has already been exported. Provincewide, a total of 11 locations or cities have exceeded the plan. Nine locations or cities exceeded the plan on average by more than 30 percent; these are: Yuncheng, Linfen, Taiyuan, Yangquan, Puzhong, Yanbei, Changzhi, Luliang and Xinxian. The total value of purchases from the composite base for export products in Yanbei district grew by 42.8 percent over that of last year.

Last year throughout the province party and government departments at all levels put the development of foreign trade in an important position by making it a crucial link of the national economy to be grasped. They gave full play to the dominance of the localities, vigorously tapped production potential, added new types of products, expanded sources of goods for export, and exerted great efforts to develop export products which would have favorable outlets in the international marketplace. Under the new conditions, new changes have occurred between the operations areas of production and marketing. In the past it was foreign trade personnel who sought production enterprises and requested the production of export products. Now, there is a gradual change toward production enterprises being the motive force in approaching foreign trade departments to provide them with goods samples, enthusiastically organizing production, and increasing sources of goods for export. The occurrence of these kinds of new changes between production and marketing, along with the strong support in many areas of export products production by foreign trade departments, have provided solid conditions for the expansion of purchasing and export of foreign trade products. In this one year, the number of types of products in excess of plan or external to plan was 324; the amount of money involved totalled 155.71 million yuan. Last year, in implementing the program to readjust the national economy, the development of industrial and agricultural production was promoted, and a fairly great change was wrought in the export products structure in our province. The total of purchases from industrial and mineral production totalled 371.66 million yuan, which represents 76.6 percent of the total value of foreign trade purchases. This is an increase of 5.3 percent over last year and an increase of 23.7 percent over 1976. Of this, coal exports increased from 187 thousand tons in 1976 to 2.08 million, for 52 million yuan in purchases, or 11 percent of the total value of all purchases. In 1976 there were only 4 of the products known as "fist merchandise." These had been developed up to 17 by last year and the total amount in purchases had reached 243.40 million yuan, or 51.5 percent of the total value of purchases. Among this "fist merchandise," those totalling more than 10 million yuan were: coal, cotton cloth, bauxite, furfural, cotton yarn, fur mats, work gloves, and frozen rabbit meat. Those totalling between 5 and 10 million yuan were: knit goods, twisted yarn, artificial furs, perfumed soap, pottery and porcelain, refined sugar, sodium sulphate, filature silk, carboxymethyl cellulose, and walnut meat. In order to stir up business, last year foreign trade departments also worked in close cooperation with concerned departments to bring in materials for light textile products and hardware tools which were processed as 76 types of merchandise, and which resulted in purchases totalling 101.85 million yuan. There were exchange purchases of a total of 9 agricultural by-products, of which 6 were: cottonseed cake, linseed cake, peanut meat, mixed beans, sesamum, and sunflower seeds. The total monetary amount for these was 6.59 million yuan.

At the same time that export goods were being actively organized, there was a great volume of imports in the form of critically needed products such as raw materials, agricultural chemicals, machinery, instruments, medical appliances, cultural and educational materials, daily use articles, textiles, and communications gear. These supported industrial and agricultural production, invigorated the marketplace, and promoted the development of cultural, educational and public health causes. At the same time, in accordance with the plan to turn our province into a base for the energy resource of coal, and adhering to the principles of self-reliance and equality and mutual benefit, and based on items proposed by provincial concerned departments and bureaus on attracting new technology, new facilities, compensatory trade and materials for processing, negotiations for signing agreements and aide-memoires are beginning or already in progress.

9420
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NEW XINJIANG RAIL ROUTE DESCRIBED

Beijing TIEDAO ZHISHI [RAILWAY KNOWLEDGE] in Chinese No 1, Jan 81, pp 10-11

[Article by Chen Yuanmou /7115 6678 6180/: "South Xinjiang (Nanjiang) Railway"]

[Text] The imposing Tianshan Mountain Range lies like a giant crouching dragon across the middle of Xinjiang, cutting off transportation between north and south. The people of various nationalities living to the north and to the south of the Tianshan have so hoped that a railroad could be built across the Tianshan so that Xinjiang's socialist construction can dash forward riding a locomotive of our times!

Now the hopes of the people of various nationalities in Xinjiang have been realized. The South Xinjiang Railway linking areas north and south of the Tianshan had its track laid and was victoriously open to traffic in August 1979 after over 5 years of arduous struggle by PLA engineering corps units and railway construction workers. At present, close attention is being paid along the entire line to completing the finishing works and opening up temporary operations by section (by last July they had already operated over 370 kilometers to Hejing [0735 7234]). It is estimated that it will be formally handed over to the state for use in 1982.

The South Xinjiang Railway begins in the north at the Turfan Station along the Lanzhou-Xinjiang Line, crosses the middle of the Tianshan and the large Turfan and Yanqi Basins and ends at strategic Korla on the northern fringe of the Tarim Basin. The total length is 476 kilometers. One stretch of this railway winds along the ancient "silk route." The coming of the rail has changed the appearance of the ancient silk route, transforming the perilous mountains and rapid torrents into a thoroughfare. This has tremendous significance for promoting the exchange of goods and materials between the interior and the borders, bringing prosperity to Xinjiang's economy and shoring up our national defense.

A Formidable Road Construction Project

Along the line of the South Xinjiang railway the topographic, geological and climatological conditions are extremely complex. There is the Gobi Desert with temperatures of 40 to 50 degrees Celsius and the Bingdaban [0393 6671 0978] at 30 to 40 degrees below zero. There are also wind gaps with perennial winds of degrees seven and eight. Except for the Gobi Desert and saline areas, over half of the sections pass through the valleys of the Tianshan. It was necessary to construct 29 tunnels and build 463 bridges. The total length of tunnels and bridges is over 50 kilometers and required over 30 million cubic meters of earth and stone work, making this a rather formidable project.

After the rail line leaves Turfan it must cross over 100 kilometers of the Gobi Desert on the western edge of the Turfan Basin. Because the terrain of the Turfan Basin is extremely sealed off and low lying, the climate is extraordinarily hot and dry. In the summer the average air temperature is 32° C or more, with the absolute air temperature reaching 47.8° C. This has been the hottest place in China since ancient times, and was commonly called the "land of fire." The Tang poet Cen Can [1478 0639] characterized the unusual heat of this place in a poem: "Clouds of fire fill the mountains, congealed, unbroken, and flying birds do not dare to come a thousand li." In addition, after spring the temperature in the basin increases quite rapidly, forming an air pressure differential with the continuing cold air in sourthern Xinjiang leading to seasonal strong winds. Each year there are northwesterly winds of force 8 or above on the Beaufort scale for 70 to 80 days. As a result, besides "land of fire," this place is also called "a storehouse of wind." When the railway heads out of Yuergou it enters the Alagou and Wulasitaigou Valleys of the middle Tianshan. At this time, the line climbs from the 800 meter elevation of the Gobi to the 3,000 meter Bingdaban of the Tianshan, and then falls from 3,000 meters to 1,200 meters. Because the mountains are precipitous, the valleys narrow and steep and the geology complex, the railway winds around the mountains, zigzagging back and forth, crossing Alagou 11 times and Wulasitaigou 25 times. Tunnels and bridges are crowded together along this stretch of the line. There are 28 tunnels alone, with a total length nearly 30 kilometers. One of these is the Kuixian [1145 0341] Tunnel, over 6 kilometers long, passing through the Kuixiandaban [1145 0341 6671 0978]. Another is China's first tunnel through a moraine ridge stratum formed as a deposit in ancient times when the glaciers melted and retreated. In addition there are seven spiral-shaped tunnels. In the narrow Xinguang Valley it was necessary to build a roadbed over 800 meters long and over 20 meters high with a volume reaching 230,000 cubic meters. In all of the Tianshan valleys were also built high graded roadbeds totaling 251 kilometers, with the steepest gradient being 22:1,000, rare in the history of China's road construction. The railway must pass through a 52 kilometer stretch of saline soil in the Yanqi Basin. The salinized soil causes the railroad bed to become loose and expand and it corrodes the tracks and the bridge and tunnel structures. The danger it poses to the line is extremely great and is a topic of scientific research on road construction projects in China. During the course of construction, the commanders and fighters of the

PLA engineering corps and the railway construction workers have carried on the glorious tradition of arduous struggle, overcome difficulties and hazards such as extreme heat, high cold, sandstorms and oxygen deficiency to subdue the "land of fire." They have pierced through the high mountains, vanquished the raging torrents and finally laid track to Xinjiang's strategic Korla.

Rich Mining and Produce

Mining resources are rich along the South Xinjiang Railway. Everywhere in the imposing Tianshan there are deposits of coal and iron as well as ferrous and nonferrous ores such as copper, lead, zinc, asbestos and crystal. The total reserves of coal in the four fields of Kerjian, Nanshan, Ehuobulake and Tashidian reache over 4.45 billion metric tons. In the Bacangtai mountain district is buried a large amount of iron ore, limestone and mica. The iron ore of Motuoshala and Xiariguoke have an iron content in excess of 50 percent. Last year a kind of rare socium bentonite was discovered. There are dense forests amid the unbroken clusters of mountains, producing snowy ridge dragon spruces (picea asperata), fraxinus chinensis Roxb., potentilla fructicosa L. and other precious trees. Various kinds of wild animals and plants abound, such as deer, wild sheep, marmots, snow cocks, swans, snow lotus, fritillaria thunbergii, Chinese gromwell and the like.

The Turfan Basin is Xinjiang's most important economic crop growing area, and enjoys the reputation in China of being the "land of melons." Early on, in the "Xiyou fanguo zhi" [Chronicle of barbarian lands in the west] it is recorded: "Lulan extensively cultivates grapes. . . sweet melons and various kinds of gourds." From ancient times, Turfan has been an abundant producer of grapes and melons. "Turfan grapes, Hami melons" is a popular folk song. The seedless white grapes produced in Turfan have thin skins, are juicy and tasty, glittering, translucent emerald green and full of nutrition. They are praised on the international markets as "China's green pearls." The sun-dried raisins from the seedless white grapes are sweet and delicious with a sugar content up to 60 percent, and are one of Xinjiang's most famous products. The Hami melons grown in Shanshan xian in the basin are large and meaty, are crisp and have a delicate fragrance, taste as good as sugar water and are shaped like carved jade pillows with decorative patterns. Famous varieties include baotaihong [3517 0669 4767], hongxincui [4767 1800 5186], xianglihuang [7449 2746 7806] and wangwen xiangli [4986 4773 7449 2746]. These melons are all described vividly in ancient records and the famous classical novel "Journey to the West." Acclaimed in past and present, in China and abroad, these rank as rare and precious melons.

All across the length and breadth of the Yanqi Basin is lush pasture. According to the surveys of the relevant departments, there is a total of nearly 20 million mu of pastureland in the three xian of Hejing, Heshuo and Yanqi. The pastures of Hejing xian alone are feeding 1 million head of livestock, the largest number of any xian in China. Among the many kinds of livestock, one which is especially renowned is the Yanqi horse. It has a graceful body and firm hooves, is nimble and moves well. Called the "dragon breed," it compares favorably with the famous Yili horse. The Bosten (Bagrax) Lake in the southeast of the basin, called "Xihai [west ocean]" in ancient times, is a famous inland freshwater lake in China. It has a surface area of 980 square kilometers and stores 9.9 billion cubic meters, and is one of the country's leading producers of reeds. The reed pond area is about 440,000 mu and produces over 330,000 metric tons per year. Reeds have a high economic value and are an extremely valuable industrial raw material in modernized industry. On the southeast bank of the lake is still an abundant store of lake salt, snow white and sparkling, high quality and tasty. Preliminary surveys show reserves of about 15 million metric tons.

These rich minerals, forests and produce along the South Xinjiang Railway Line will be thoroughly developed and utilized with the building and opening of the railroad and will play their proper role in the four modernizations.

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